LONG LAKE NATIONAL WILDLIFE REFUGE
AND
LONG LAKE WETLAND MANAGEMENT DISTRICT
MOFFIT, NORTH DAKOTA

ANNUAL NARRATIVE REPORT

CALENDER YEAR 1987

LONG LAKE NATIONAL WILDLIFE REFUGE

Moffit, North Dakota

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Calendar Year 1987

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

LONG LAKE NATIONAL WILDLIFE REFUGE
LONG LAKE WETLAND MANAGEMENT DISTRICT
Moffit, North Dakota

ANNUAL NARRATIVE REPORT
Calendar Year 1987

Steven A. Knode 5/24/88
Refuge Manager Date

Dale B. Henry 6.6.88
Refuge Supervisor Date

E. Dale Stearns 5/25/88
Project Leader Date

Ralph F. Finn 4/13/88
Regional Office Approval Date

INTRODUCTION

Long Lake National Wildlife Refuge (NWR) is located in south-central North Dakota near the town of Moffit, ND. The 22,310 acre refuge consists of the 15,000 acres of brackish to saline Long Lake, 1,000 acres of other wetlands, and about 6,000 acres of tame and native grassland, woodland, and cropland. The lake varies from one-quarter to two miles in width, is eighteen miles long, and reaches depths of up to nine feet.

Long Lake NWR was established in 1932 primarily to reduce losses of migratory waterfowl and shorebirds to botulism. In the 1930's two dikes were built to divide Long Lake into three water management units. During the period of 1941-1943 there were 250,000 birds lost to botulism. Manipulation of water levels has been used to attempt to reduce the incidence and severity of botulism outbreaks but the amount of water that can be moved is limited. Under certain conditions botulism outbreaks still occur on the refuge, however, in many years no losses occur.

The refuge serves as major migration and staging area (with 1984 peak populations of 35,000 geese, 13,800 ducks, 10,000 sandhill cranes, and thousands of other marsh and water birds). It's an important waterfowl nesting area and an important wintering and production area for resident game species.

Sunset on Long Lake Refuge. (87-MWG)

TABLE OF CONTENTS

G. WILDLIFE

H. PUBLIC USE

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

INFORMATION PACKET - - - (inside back cover)

A. HIGHLIGHTS

An avian botulism outbreak started in late June and continued through September with about 6,000 birds being picked up on Long Lake. Five other areas in the district were also cleaned up. Three additional spots were discovered after the fact during the hunting season. Total losses on the Long Lake Refuge and district were estimated at 39,000 birds. (Section G. 17).

This spring Long Lake experienced the highest water level readings since 1952. A peak elevation of 1718.44 was reached on March 24 in Units I & II. The lake stayed in flood stage until August 14. (Section F. 2).

Steve Knode became the Long Lake Refuge Manager after Mike McEnroe transfered to Devils Lake WMD. (Section E. 1).

In March Alice Hanley was hired as the clerk/typist after several summers as a volunteer and biological aid. (Section E. 1)

The 450 acre Unit II marsh constructed by D.U. was essentially completed this year at a cost of approximately $135,000. (Section F. 2).

A total of 89 giant canada geese were transported from the Audubon Lake to Long Lake Refuge. (Section G. 12).

B. CLIMATIC CONDITIONS

After a wet fall in 1986, a 12.5 inch snow in February added to the runoff, resulting in excellent wetland conditions and high water levels in Long Lake. As the summer progressed into fall, however, the moisture stopped with only 0.75 inches of preciptiation falling from September through December.

A period of hot, muggy weather hit the area in late July, adding to the botulism problems. Even the nights were hot which is unusual for North Dakota.

The 13.88 inches of precipitation is well below the long term average of 16 inches. Unless good moisture is received in the early part of 1988 the wetlands could be in trouble.

1987 Weather Conditions

Month	Max. Temperature	Min. Temperature	Total Precip.	Snow
January	51	-10	0.06	0.62
February	50	10	1.03	12.50
March	55	-11	0.46	0.50
April	88	21	0.07	
May	92	28	4.53	
June	95	44	2.24	
July	95	47	3.17	
August	95	40	1.57	
September	91	38	0.40	
October	80	12	Tr.	
November	64	6	0.13	0.50
December	50	- 9	0.22	0.50
			13.88	14.62

C. LAND ACQUISITION

1. Fee Title

Of Long Lake NWRs 22,310 acres, 12,579 were purchased in fee title by the U.S. Government. An additional 1,170 acres were reserved from the public domain. In 1953 the acquisition of an additional 3,520 acres was approved (presumably by MBCC).

One of many fence corners where the refuge boundary is far into the lake. (87-MWG)

Much of the MBCC approved land is on the east end of Long Lake where most of the botulism occurred this year. In fact, 65 percent of the birds picked up in 1987 were outside of the Long Lake refuge boundary.

When Long Lake Refuge was established in 1932 the primary objective was to buy water for the control of botulism. Like many older refuges in North Dakota, there is a shortage of uplands for nesting cover. Of the 22,310 acres within the Long Lake Refuge boundary approximately 16,000 is water. Therefore, in an effort to obtain some upland nesting habitat, a request for an expansion of the MBCC boundary will be submitted to the R.O. in 1988.

2. Easements

The only easement activity this year was a suspected haying violation that turned out to be an authorized action on State School Land on the west end of Long Lake. The refuge has an easement to flood the land in this section but the land use is auctioned off. The current leasee has the permit for three more years. At that time the refuge may consider bidding for control of this grass upland adjacent to Long Lake.

D. PLANNING

2. Management Plan

The refuge staff prepared annual management plans covering trapping, predator management, prescribed burning and water use.

3. Public Participation

The refuge staff presented revenue-sharing checks to the three county commissioners at the April meetings. Checks were issued for the following amounts:

Burleigh County	$14,561.00
Kidder County	$10,617.00
Emmons County	$ 2,699.00

We experienced the usual positive response from the commissioners who appreciated the money.

5. Research and Investigations

The refuge staff collected pheasant, sharp-tailed grouse, and gray partridge brood data as to their age, number and location.

The following refuge brood observations were provided to the N.D. Game and Fish Department:

Pheasants	15
Partridge	4
Grouse	1

During the sandhill crane hunting season, refuge personnel collected harvest data on cranes as to their age, sex, weight, and physical measurements. This information was also collected for the Game and Fish Department to evaluate the crane season.

The Long Lake refuge staff assisted the Northern Prairie Wildlife Research Center with nest dragging points and islands again this year. An average of 2 drags per week with 2-3 staff members per drag were needed from May 18 through July 9.

Nest Drag Results - Long Lake NWR/WMD, 1987

	Browns Is.	E. Peninsula	Slade NWR	L. Harriet
Cover	Tame	Native	Tame	Native
Acres	60	103	27	11
# of Nests	127	55	6	13
Apparent Success	96.8%	21.8%	33.3%	84.6%
Mayfield Success	94.3%	7.2%	13.4%	85.5%
Treatment	Idle	Idle	Idle	Idle
Predator Control	Yes	No	No	Yes

Duck's view of the D.U. Peninsula cut-off creating Browns Island. (87-MWG)

A field test for avian botulism antitoxin was conducted by the National Wildlife Health Laboratory this summer. Ninety-seven blue-winged teal were used to test the effects of the antitoxin. A total of 48 birds were treated with the antitoxin while 49 were injected with only a saline solution. The birds were sub-divided into 12 groups depending on their age and the advancement of the disease based on clinical signs. The results of the study are listed in the following table.

RESULTS OF TYPE C BOTULISM ANTITOXIN FIELD STUDY
ON BLUE-WINGED TEAL AT LONG LAKE NWR, NORTH DAKOTA

ANTITOXIN

Clinical Sign Classification[1]	AHY[2]			HY[3]			TOTAL		
	Inoculated	Recovered	(%)	Inoculated	Recovered	(%)	Inoculated	Recovered	(%)
1	10	10	(100)	9	4	(44)	19	14	(74)
2	13	12	(92)	10	1	(10)	23	13	(57)
3	4	3	(75)	2	0	(0)	6	3	(50)

SALINE

Clinical Sign Classification[1]	AHY			HY			TOTAL		
	Inoculated	Recovered	(%)	Inoculated	Recovered	(%)	Inoculated	Recovered	(%)
1	6	6	(100)	14	8	(57)	20	14	(70)
2	11	4	(36)	13	0	(0)	24	4	(17)
3	3	0	(0)	2	0	(0)	5	0	(0)

1 Clinical sign classifications defined: (1) Unable to fly but able to use wings and legs in escape attempts; (2) unable to move but able to hold head up; and (3) unable to move and unable to hold head up.
2 AHY - After Hatch Year
3 HY - Hatch Year

The test indicated that the antitoxin was most successful on adult birds with clinical sign classifications of 2 and 3.

1. Steven A. Knode, Refuge Manager; GS-11 PFT EOD 3/15/87
2. Michael R. McEnroe, Refuge Manager; TRANS 2/15/87
3. Michael W. Goos, Biological Technician; GS-6 PFT
4. Alvin Hottman, Maintenance Man; WG-8 PFT EOD 6/21/87
5. Alice M. Hanley, Clerk-Typist; GS-3 PPT EOD 3/1/87
6. Don Lantz, Volunteer; 5/18-8/21
7. Chad Maier, Volunteer; 5/26-8/28
8. Dan Svinger, Volunteer; 10/5-12/22

E. ADMINISTRATION

1. Personnel

Long Lake NWR/WMD is staffed with three permanent full-time employees; a refuge manager, a biological technician, and a maintenance man; plus a permanent part-time clerk-typist.

In February Mike McEnroe, Long Lake manager for three years, transferred to Devils Lake WMD as Project Leader. Steve Knode transferred from CMR NWR to fill the manager position in mid-March.

Alice Hanley, temporary biological aid, became the new permanent part-time clerk-typist on March 1.

Alvin Hottman was promoted from tractor operator WG-6 to maintenance man WG-8 on June 24.

The refuge staffing pattern from 1987 and the proceeding four years is shown below:

Year	PFT	PPT	Temporary	SCA Volunteer	Total FTE
1987	3	1	0	3	4.3
1986	3	1	1	1	3.8
1985	3	1	1	2	3.8
1984	3	0	1	2	3.8
1983	3	0	1	0	3.2

Refuge Manager Steve Knode was selected as the North Dakota FWS Key Whooping Crane contact. Clerk-typist Alice Hanley received a Special Achievement Certificate and cash award for her work on the Services CRP Piggyback Lease program.

Refuge staff received the following training in 1986:

Individuals	Training	Dates
Goos	16hr. Pinch Hitter	February
Knode & Goos	40hr. LE Refresher	March
Knode, Goos Hanley, & Hottman	8hr. ATV Training	April
Knode, Goos Hanley	40hr. Wetland Class.	June
Hottman	16hr. Electronics Mech.	August

4. Volunteer Program

Three paid ($10/day) FWS volunteers; Don Lantz, Chad Maier, and Dan Svinger were on staff in 1987. They were a valuable addition to our staff and with their help we were able to accomplish many projects on Long Lake NWR/WMD that we would have otherwise been unable to do. In addition three locally recruited volunteers, Jennifer Knode, Frank Knode, and Ila Cron donated their time and assistance on refuge and district projects. The six Long Lake NWR/WMD volunteers contributed a total of 500 hours of work in 1987.

Volunteers Chad Maier and Don Lantz.
(87-SAK)

5. Funding

Funding for Long Lake NWR and WMD is included in the budget for the Arrowwood Complex. The Complex includes Arrowwood NWR and WMD, Valley City WMD, and Long Lake NWR and WMD.

The Complex's OM budget for the past five years is compared below. For further description of funding, refer to the Arrowwood NWR narrative.

Year	Total Available
1987	611,320
1986	690,700
1985	641,700
1984	690,900
1983	530,000

6. Safety

Mike Goos served on the Safety Committee in 1987. Safety meetings were held to watch safety movies and discuss safety topics relevant to our daily operations on the refuge and WMD.

Volunteer Chad Maier punctured his hand with a piece of wire, requiring a tetanus shot and resulting in one-half day of "lost time".

7. Technical Assistance

Technical assistance to the following non-service individuals or agencies was provided in 1987:

January - Mike McEnroe, Lloyd Jones and Game and Fish Commissioner Henegar gave a panel discussion for the North Dakota Water Users Associatons on cooperation between farm, water and wildlife groups.

April - A total of 25 mallard eggs were collected for propagation from the East Peninsula and given to Lyle Schoonover in association with the Dakota Wildlife Trust.

October - Knode & Goos assisted the city of Robinson with a sewage lagoon problem inside a wetland easement.

October - Knode & Goos judged two wildlife habitat and food plots for the North Dakota Wildlife Trust.

November - Knode & Goos assisted a Kidder County township board in solving a ditch plug problem on an easement. Subsequent easement violatons were discovered.

Year around - "Swampbuster" violations located during easement flights and routine travels, have been reported to ASCS offices. To date three violations have been reported.

Knode inspected a possible "sodbuster" violation. After checking with SCS the case was dropped.

The Service's new "CRP Piggyback Lease" program was well received in the three county district. Long Lake WMD has a total of 7,255.6 acres, largest in the state, enrolled in the program with 206.3 acres in Emmons, 2,320.5 acres in Burleigh, and 4,728.8 acres in Kidder. The ASCS offices in Emmons, Burleigh and Kidder counties have enrolled 40,100, 56,961, and 97,284 acres respectively into the Conservation Reserve Program (CRP) as of the July 1987 sign up.

F. HABITAT MANAGEMENT

1. General

Long Lake NWR is managed to provide a variety of habitat types for wildlife species. The refuge includes approximately 6,300 acres of rolling prairie and cultivated uplands and 16,000 acres of wetland. A majority (4400 acres) of the upland is cool season native grassland and the balance is tame grass, cropland, or woodland. A majority (15,000 acres) of the wetland is Long Lake and the balance is natural wetlands, man-made wetlands, and Long Lake Creek. The upland areas are managed by cultivation, burning, and grazing to provide nesting cover, winter cover, and food. The wetlands are managed to reduce botulism losses and to increase waterfowl production.

The capability to manage the overall water level of Long Lake is severly limited; mostly by the lack of an outlet. The lake is divided by dikes which contain water control structures into three very large impoundments. There is little ability to manage water levels between impoundments. Unfortunately, there is no ability to manage the overall lake level and hense water flowing into refuge impoundments remains until it gets high enough to go over the dikes. To reduce botulism, the east impoundment (Unit III) has been held as low as possible or as high as possible, neither of which as been very successful.

2. Wetlands

Wetland conditions on the refuge went from excellent following spring run-off to good in the PEMFs to poor in the PEMAs and PEMCs by the end of 1987.

Abundant moisture was received from January through August (13.13 inches) and then only 0.75 inches in September through December. At freeze-up soil moisture was in short supply.

Water levels in Long Lake in 1987 were the highest they have been since the 1950's. At the begining of 1987 Unit I was at 1714.54, Unit II was at 1714.38, and Unit III was 1714.27. Mid-March brought mild temporatures and spring run-off. By March 24 water levels in Unit I and II had peaked at 1718.44. On this date water was 2.44 feet over the A-dike emergency spillway, 1.94 feet over the B-dike and C-dike emergency spillways, and was touching the shop at the old headquarters. Traffic was stopped on all three refuge dikes and on the south entrance road. Access to the headquarters was limited to one lane traffic on the partially damaged north entrance road. Water levels in Unit III continued to rise until April 10 when all units

equalized at 1717.44, nearly a foot over the B-dike and C-dike emergency spillways.

Water levels then slowly receded through mid-May. Spring rains increased water levels slightly from mid-May until early June when water levels dropped for the rest of the year. Water levels remained above the B-dike and C-dike emergency spillway until August 14 and remained above the A-dike emergency spillway until October 6. Water levels in all three units at freeze-up were at 1715.75, only 0.25 feet below the A-dike emergency spillway.

B-dike spillway 3/27/87. (87-MWG)

Water touching shop at old headquarters.
(87-MWG)

Entrance road north of new headquarters.
(87-MWG)

Water over C-dike emergency spillway.
(87-MWG)

Water flowed out of Unit I over the A-dike emergency spillway from March 23 to September 8. No flow was recorded from September 8 to October 6 although water levels were slightly above the spillway level. A-dike was breached by high water on May 26. Flows over the emergency spillway and through the breach into Long Lake Creek were estimated at 30,835 acre/feet.

Water flowed over the C-dike spillway from March 24 to June 12. On June 12 Burleigh County was allowed to fill in the emergency spillway on C-dike to allow traffic to cross the lake. Most of this fill has now been removed.

A-dike was breached by high water.
(87-MWG)

The Long Lake staff did not have an opportunity to accomplish any water control on the refuge in 1987. Water levels were above the emergency spillways and above the B-dike and C-dike control structures for most of the year. No water was pumped from Long Lake Creek into G-18 marsh this year.

A used culvert was purchased for $25 and installed on the north entrance road to create a pond. Several dams on Long Lake NWR were repaired by a dozer and crew from Arrowwood NWR. The repaired structures included G-4a, G-4b, G-4c, G-12, G-19a, and A-10.

A culvert was installed to create a wetland in G-7b. (87-MWG)

Completion of the 450 acre Unit II marsh development project with Ducks Unlimited was slowed by wet conditions in 1987. The dike was in place prior to 1987 run-off, but water levels in the marsh and Unit II equalized above the dikes emergency spillway. The dike received some damage from the high water and repairs were completed in September by the contractors. The contractor was also able to install most of the water control structure.

A water quality study agreement was reached in 1987 to provide some of the background data necessary for an outlet to Long Lake. The study will begin in the spring of 1988. This will be the first step in gaining a discharge permit from the State. After we get the discharge permit we can proceed with the construction of an outlet to allow water management on Long Lake for the control of botulism.

Unit II marsh prior to construction.
(87-MWG)

Unit II marsh after D.U. finished.
(87-MWG)

3. Forest

Tree plantings at A-5 (1984), A-11 (1983), and the new headquarters were cultivated this year. There were no new tree plantings this year.

4. Cropland

This year there were fifteen farming units on the refuge, ranging in size from 1.0 to 156.4 acres. Four of the units A-7, A-11, Tower, Old HQ, plus 44.1 acres of A-1 and 16.0 acres of A-5 were force account farmed. The remaining units were farmed by nine cooperators. The refuge's share of the was generally one-third of the small grain or one-fourth of the row crops. DNC and alfalfa are used in the crop rotation to provide nesting cover and soil rejuvenation. The farming units are heavily used by waterfowl, sandhill cranes, deer, pheasants, and other wildlife.

Refuge Farming Summary, 1987

Unit	Acres	Refuge Share	Coop. Share	DNC/ Alfalfa	Force Account
A-1	68.5			24.4	44.1 DNC
A-2	72.1	25.2 C/B/A	29.0 B/O/R	16.9	
A-3	43.1	4.9 B	23.3 B	14.9	
A-4	59.2	15.6 B	17.8 B	25.8	
A-5	83.0	13.0 O (baled)	30.0 O	24.0	16.0 SW
A-6	96.0	14.4 B	29.3 B	45.9	6.4 C 1986 Plant
A-7	17.0				17.0 W/C/S
A-10	52.0	38.0 O	14.0 C		
A-11	17.0				17.0 C/SM
A-12	156.4	27.7 W*	83.3 C/W	45.4	
A-13	65.7	11.2 O	26.0 O	28.5	
A-14	36.6	6.7 B	29.9 B		
A-15	40.8	10.3 W	20.5 SG	10	
Tower	4.0				4.0 C/S
Old HQ	1.0				1.0 C

O=Oats, B=Barley, C=Corn, R=Rye, S=Sunflowers, SC=Sweet Clover, W=Wheat, M=Millet, A=Alfalfa, SG=Small Grain, SF=Summer Fallow, P=Plowed, SW=Switchgrass, SM=Sorghum

* The harvested wheat will be used for winter feeding.

The refuge received surplus corn, sunflowers, and sorghum seed from AGSCO Inc., through the ND Game and Fish Department. This program continues to produce high quality food plots.

In Unit A-1 the refuge planted 44.1 acres of DNC since the cooperator was no longer able to reach this unit because of high water. In A-5, 16.0 acres of switchgrass obtained from Valley City WMD was fall seeded.

Five fields are being farmed as part of a DNC rotation. Two fields, 35.0 acres in G-8 and 35.0 acres in G-16, were broken this year. Two fields; 52 acres in G-12b and 20.0 acres in G-17c, were farmed for the second year, while one field, 34.0 acres in G-17b, was seeded to nurse crop and DNC.

During easement flights photos were taken of the refuge grassland units to help identify tame grass areas. (87-MWG)

5. Grasslands

There are 27 grassland units on Long Lake NWR in addition to the fields that are seeded to cover in the farming units. They total 5,037 acres and vary in size from 75 to 400 acres. A Grassland Management Plan for these units was prepared and approved in 1985 and was implemented in 1986. The plan calls for more frequent evaluation of range conditions, both to evaluate past treatments and to prescribe future treatments. Prescribed treatments for native uplands include short-term grazing and burning. Treatments for tame grass stands include planting to DNC, interseeding, and scarification. Treatments are proposed for 5-7 units each year.

In 1987 robel readings were taken in G-4c, G-7b, G-9a, G-10, and G-12a. Plans were made to graze five units, burn one, and interseed one-half of one. All of the planned work was completed.

The 1985 native grass planting of 24.5 acres in A-11 was evaluated this year. There was some western wheatgrass, but very few other natives. Pigeon grass and broad leaved plants dominated the field. The field will be treated with patience and evaluated again next year.

6. Other Habitats

There were eight goose tubs, one basket, and four wood duck nesting structures erected in 1987. The structures were checked for use and four goose nests were noted. The single basket was erected south of the south entrance road in 1987.

Twenty banded, round flax bales were placed during the winter in G-17a, G-17b, G-17c, G-18 and in the marsh west of the fishing bridge.

Pintail point, a 17 acre peninsula located on the south shore of Unit III, was cut-off with a predator fence in November. The fenced peninsula should now provide a much more secure nesting area and several hundred ducks.

7. Grazing

Five grassland units were selected to be grazed in 1987. After advertising in local newspapers and post offices, we held a lottery on April 6. Four of the units were awarded immediately and the fifth was awarded in October.

Grazing Use in Long Lake WMD, 1987

Unit	Acres	Date	AUMs Available	AUMs Used	AUM Cost	Refuge Receipts
G-2	204	5/16-6/15	200	141.3	$7.65	$1080.72
G-8	75	10/09-11/20	75	81.5	$5.09	35 acres broken & fallowed
G-11	205	4/29-5/29	200	108.4	$7.65	$911.76
G-16	140	10/19-11/12	140	126.8	$5.09	$634.98
G-20	220	5/05-6/20	200	75.5	$7.65	$577.42

A good treatment was received on G-2, G-8, and G-16. Units G-11 and G-20 were grazed too lightly to effect a good treatment. The field in G-8 will be summer fallowed in the summer and fall, then reseeded to DNC in 1988. G-20 will be grazed one-half at a time to reduce the size of the pasture. Future grazing permits will require a minimum AUM removal to provide good complete vegetative responses. Otherwise, all we have done is feed cows.

8. Haying

A total of 18.0 acres in A-2 was interseeded this spring by the cooperator in exchange for hay received in 1986. Discing was completed this spring on 28.5 acres of DNC in A-13 which was hayed in 1986.

Three fields were hayed on the refuge in 1987. Two fields, a 35.0 acre field in A-2 and a 30.0 acre field in A-15, will be interseeded with alfalfa and sweet clover by the cooperator next spring. The other field, 110.00 acres in G-7a, was disced twice by the cooperator in November. This field was then interseeded via force account with alfalfa and clover. Approximately one-half of the 110 acres was seeded with Teton Spreader alfalfa. The other one-half was seeded to Ranger alfalfa.

9. Fire Management

One prescribed burn was conducted on Long Lake NWR this year on the 122 acre G-3 unit which had firebreaks disced in 1986. They were touched up just prior to the burn which was conducted on April 21, 1987. The weather forecast was for 10-20 m.p.h. west winds, but the wind never developed. Several whirlwinds were observed and the area was burned with wind speeds generally under 5 m.p.h. This did allow for a good litter burn, but made for a long, drawn out fire.

A 5.4 acre wildfire occurred in G-5 the night of October 14 following the burning of a junkpile. The fire was discovered and put out the morning of October 15. Eleven days later on October 26 the fire reignited and burned 75.0 more acres before it was again put out. No eruptions of this Phoenix fire have occurred since then.

Whirlwind in G-3 burn. (87-MWG)

Post burn Robel reading in G-3.
(87-MWG)

10. Pest Control

Leafy spurge patches totalling about a tenth of an acre were sprayed by the refuge staff in G-4a, G-4c, and A-5. A three acre patch of spurge in G-4b was fertilized and experimentally grazed. Results were poor with very few plants being damaged.

11. Water Rights

Long Lake NWR has a water right for 99,055 acre/feet with a February 17, 1936 priority date. This includes 47,995 acre feet of storage and 51,110 acre feet of seasonal use.

13. WPA Easement Monitoring

See Long Lake WMD Narrative.

G. WILDLIFE

1. Wildlife Diversity

In addition to the primary objectives of botulism control and waterfowl production, Long Lake NWR is managed to provide for wildlife diversity. The lakes, marshes and various upland types are habitat for a large variety of wildlife species.

There are 212 species on the Long Lake NWRs bird list. Unusual sightings in 1987 included two least bitterns observed on Unit III, and two white-faced ibis' seen in the Unit II marsh, and a bull moose observed just south of the refuge in September.

2. Endangered and or Threatened Species

During 1987, Long Lake staff recorded 15 bald eagle observations. Observations occurred during spring (11) and fall (4) migrations. There were no whooping cranes sighted on the refuge this year.

3. Waterfowl

Spring waterfowl migration on the refuge began on March 12 with the arrival of a single Canada goose. Small groups of geese and ducks followed closely behind until migration kicked into high gear on March 21. During the next few weeks waterfowl continued to move into the area and nesting began. The first duck brood (6 pintails) was observed on May 18 and the first goose brood (5) was recorded on May 22.

Ducks on Unit II during spring migration.
(87-MWG)

Unusual waterfowl sightings of the refuge this year included cinnamon teal drakes seen on April 30 and July 9, and a hooded merganser with a brood of four observed on July 10.

We conducted breeding pair counts on the refuge in May. The areas covered were Units I, II, and III; the Unit II marsh; the G-18 marsh; and the dams along the north side of Units I and II. The 1987 pair count data indicated 1,622 pairs of breeding ducks, slightly lower than the 1986 figures. (Included in these numbers are pair estimates for the unidentified ducks recorded during the count). The table below shows pair count results for the last five years.

Long Lake NWR Pair Counts

Species	1983	1984	1985	1986	1987
BWT	674	859	849	634	828
Gadwall	211	467	291	258	215
Mallard	157	246	172	190	150
Pintail	134	273	214	174	94
Shoveler	302	451	388	309	293
Redhead	39	41	56	46	9
Wigeon	18	29	45	25	11
Ruddy Duck	14	21	6	22	16
GWT	7	18	8	3	3
Scaup	2	1	4	2	2
Wood Duck	-	-	-	-	1
	1558	2406	2038	1663	1622

Long Lake staff nest dragged three refuge fields in 1987. Two fields, Brown's Island and a native field on the East Peninsula, are in the Northern Prairie Wildlife Research Center's Point and Island Study and are discussed in section D.5.

The third field dragged was a 22 acre DNC field on the East Peninsula in Unit III. Seven mallard, six gadwall, four blue-winged teal, and one shoveler nest were found for a total of 18 nests. The eggs from three mallard nests were removed and given to the Dakota Wildlife Trust for their mallard propagation program. Of the remaining nests, 10 were destroyed, four hatched and one abandoned resulting in 28.6 percent apparent and 10 percent Mayfield success rate. Since the East Peninsula is the control for Northern Prairie's Point and Island Study, no predator control was conducted.

We found 15 nests (8 gadwall, 2 mallard, 2 pintail, 1 blue-winged teal, 1 unidentified, and 1 destroyed) during a nest search on the new Unit II island. On an informal count in the Unit II marsh we estimated approximately 50 overwater duck nests (ruddy, mallard and redhead).

Waterfowl brood counts were conducted on Units I, II, and III in mid-July. A total of 282 broods were recorded with blue-winged teal (99) being the most abundant followed by gadwall (47), pintail (33), shoveler (19), mallard (14), wigeon (8), ruddy (2), and scaup (1). Sixty-one unidentified broods were also recorded.

This brood number is much higher than last year's 92 broods. However, the majority of broods (230) were recorded in Unit II. The high water in this unit may have made it easier to see the broods than in previous years. Brood counts on Long Lake are difficult to conduct so our numbers are less than reliable. Four of Long Lake goose nesting structures were used this year with all nests being successful.

Ducks, especially green-winged teal and pintail began staging on the east end of Unit III in August. By mid-September 15,500 ducks were on the refuge with mallards, pintails, shovelers and blue-winged teal the most abundant species. The mallard population continued to rise as the other duck populations declined. By mid-October the mallards had peaked at 6,000.

The first migrant Canada geese arrived in late August. Goose populations rose in September and October to a peak of 21,315 Canadas, 2,000 snows, and 190 white-fronts. Tundra swan populations peaked at 160 birds in October.

A flock of about 900 mallards and 250 Canada geese took advantage of the mild fall and open water conditions, staying on Unit I until December 15.

4. Marsh and Water Birds

The traditional black-crowned night heron colony in Unit III was flooded this year. However, rookeries were active in several small bays along Unit III with approximately 300 nests. Another 225 nests were observed in the Unit II marsh on a June 1 survey.

Eared and western grebes were commonly observed near B and C dikes this year. Colonies of aproximately 250 western grebes and 150 eared grebes nests were observed in the Unit II marsh.

Approximately 200 white pelicans spent the summer on Long Lake this year. Many congregate around the water control structures on B and C dikes feeding on minnows and providing refuge visitors with good viewing. Double-crested commorants also gather near the B dike structure to feed. The rock islands in Unit II serve as a roosting site for approximately 50 cormorants. Cormorants nested on the east end of Unit III about one mile west of the East Peninsula.

Great blue herons and American bitterns are commonly observed on the refuge throughout the summer although no nesting was known to have occurred. Least bitterns were observed at two different locations on Unit III this year, a new sighting for the refuge. Approximately six pairs of cattle egrets were observed nesting in the Unit II marsh. A common egret was observed near the old headquarters in May. About 10 were seen in August and early September on the east end of Unit III.

Another unusual sighting by the refuge staff this year was two white-faced ibis' in the Unit II marsh.

The first sandhill cranes began arriving in mid-August with 49 observed on Unit III on August 14. Numbers continued to build throughout August and September until approximately 8,000 were roosting on the refuge. Their numbers gradually declined during October. Most cranes were gone by mid-November.

5. Shorebirds, Gulls, Terns, and Allied Species

The Unit II marsh was very attractive to colonial nesting birds. On June 1st we estimated it had 150 Franklins gull, 75 common tern, and 75 black tern nests. The Franklin's gull colony on Unit III was inactive this year.

Due to the high water conditions similar to 1986, Unit III lost virtually all its sandbars and mudflats therefore it did not have high numbers of shorebirds. The mudflats in the Unit II marsh did however, attract large flocks of shorebirds. During July and August phalaropes, godwits, dowitchers and sandpipers were commonly observed. Willets and ring-billed and California gulls were also observed in the Unit II marsh.

6. Raptors

Northern harriers, Swainson's hawks, ferruginous hawks, red-tailed hawks and great horned owls are commonly observed on the refuge. Northern harriers commonly nest on the refuge and there are several Swainson's, ferruginous, and red-tailed hawk nests on or near the refuge. Great horned and short-eared owls also nest in the area. A burrowing owl pair was observed nesting north of the headquarters this year.

The spring and fall migrations provided observations of the following raptors: golden eagles (19), bald eagles (15), prairie falcons (3), rough-legged hawks and kestrels. Refuge staff recorded eight snowy owl observations. A turkey vulture, an uncommon sighting, was also seen this August.

8. Game Mammals

Whitetail deer continue to increase in the vicinity of the refuge. Another mild winter allowed the local herd to come through in good shape. During early fall, a group of up to 18 was commonly seen feeding on winter wheat in a field in A-7. No aerial deer survey was flown for the refuge due to the lack of snow. We estimate the winter refuge population at approximately 225 deer.

A bull moose was reported on a neighboring farm in September. He was just passing through the area, though, and headed south that evening.

10. Other Resident Wildlife

The ring-necked pheasant population appears to continue to increase on the refuge. An established crow count route was run twice in June with an average of 165 crows heard. This was a decrease from the 1986 average of 275 crows, however, the trapping of about 50 roosters by North Dakota Game and Fish Department personnel may have accounted for the lower index. We estimate a refuge winter population of 1,495 pheasants.

Sharp-tailed grouse were counted on dancing grounds in April and early May. Counts on 12 grounds showed a total of 141 grouse with 113 males and 28 females. This is 18.5 percent

decrease from last years' count of 169 total grouse (202 males, 33 females) on 14 grounds.

No formal censusing is done on gray partridge. An estimated 20 to 25 coveys inhabit the refuge.

Coyotes, whitetail jackrabbits, cottontail rabbits, and muskrats are often observed. Raccoons, striped skunks, mink, badger, weasels, beaver and red fox are infrequently observed.

11. Fisheries Resources

Fishing at Long Lake NWR is generally limited to three areas of Long Lake Creek and Unit I. Northern pike and bullheads are the primary catches with an occasional walleye taken. This year the fishing along the creek was excellent which attracted numerous anglers and resulted in many limits of northern pike being pulled from the creek. (Section H 9).

Units II and III lack significant fisheries occasionally holding bullheads and a few minnows. No fish are stocked on Long Lake NWR.

12. Wildlife Propagation and Stocking

In an attempt to increase our local flock, we released 89 giant Canada geese in Unit II in early July. Fourteen adults and 30 goslings from the Audubon NWR flock plus five adults and 40 goslings from the North Dakota Game and Fish Department, were moved to the Lake. Hopefully, next spring some will return to call Long Lake NWR home.

15. Animal Control

Long Lake staff conducted spring predator trapping primarily to remove skunks and raccoons. Live and conibear traps were placed along roads and in areas we travelled daily. Conibear traps were also placed on Brown's Island and the new Unit II Island. A total of 10 striped skunks, 5 raccoons, 2 Franklin's ground squirrels, 1 spotted skunk, 1 red fox, 1 mink, and 1 feral cat were removed from the refuge.

The refuge received a deer depredation call from a refuge neighbor in March. North Dakota Game and Fish Department and refuge personnel spread bloodmeal around the farmer's corn, which solved the problem.

16. Marking and Banding

Refuge staff began banding in late August using swim-in traps in the Unit II marsh. Thirty-nine birds were captured and banded before a botulism outbreak occurred.

Banding results are shown below.

Banding, 1987

	AHY-M	AHY-F	HY-M	HY-F	Total
GWT	1	1	1	1	4
BWT	8	7	5	1	21
Pintail	-	1	-	-	1
Mallard	9	3	1	-	13
TOTAL	18	12	7	2	39

Photo of Long Lakes goose release. (87-JK)

17. Disease Prevention and Control

For the 5th straight year botulism was a problem on Long Lake NWR. The first dead birds (9) were picked up on June 24 on Unit III. The botulism outbreak concentrated in the small bays along the lake and the newly flooded private land east of the refuge boundary. The high lake levels allowed a quick, efficient pick-up, but resulted in more birds to pick up due to newly flooded areas. We picked up about 65 percent of the affected birds on private land in Unit III. A total of 4,315 birds were picked up on Unit III, of which 2,983 were ducks.

The new Unit II marsh also developed a bad case of botulsim this year. The first birds were picked up on July 28 and the outbreak lasted until mid-September. The newly flooded mudflats and vegetation seemed to cause the outbreak. The thick stands of emergent vegetation in the 450 acre marsh made cleanup very difficult. Propane (Zon) guns borrowed from the North Dakota Game and Fish Department and ADC, were placed in the marsh to haze the birds from the area. They were successful in keeping most of the ducks away but had little effect on the shorebirds. The total dead bird count for this area was 1,951 of which 1,359 were ducks.

Again this year sick birds were treated with botulism antitoxin. Of the 1,162 birds treated, 762 recovered and were released.

A special thanks to the FWS Bismarck Wetland Habitat Office, Arrowwood NWR staff, Ducks Unlimited personnel, and the National Wildlife Health Center personnel for their help in our cleanup efforts. Their assistance is appreciated greatly.

Total Birds Picked Up on Long Lake NWR in 1987

	Unit II*	Unit III**
Pintail	124	314
GWT	473	691
BWT	264	708
Shoveler	110	182
Mallard	102	208
Gadwall	80	72
Wigeon	15	16
Ruddy	3	1
Redhead	0	3
Canvasback	0	0
Wood duck	1	10
Unidentified ducks	172	306
Unidentified ducklings	12	472
White-fronted goose	0	1
Coot	171	551
Herring gull	0	1
Ring-billed gull	5	76
California gull	0	17
Western grebe	4	182
Pied-billed grebe	0	4
Eared grebe	0	9
Franklin's gull	10	36
Avocet	5	27
Terns	3	6
BC night heron	1	15
Bittern	1	1
Pelican	1	3
Egret	1	0

Great blue heron	2	0
Cormorant	2	3
Marbled godwit	1	7
Willet	0	1
Dowitcher	17	91
Sora rail	14	7
Killdeer	1	3
Yellowlegs	204	144
Sandpipers	110	57
Ruddy turnstone	4	0
Wilsons phalarope	0	2
Snipe	0	1
Semi-palmated plover	2	2
Black bellied plover	1	0
Unidentified shorebird	32	79
Blackbirds	0	2
Eastern kingbird	0	1
Red-tailed hawk	0	1
Great-horned owl	0	1
Marsh hawk	0	1
TOTAL	1,951	4,315
TOTAL BOTH UNITS	6,266	

*Entirely in the refuge
**35% FWS lands

In an effort to determine the fate of the "recovered" botulism birds we banded them. We immediately discovered that some of the birds were flying into Unit II marsh and becoming reinfected and dying of botulism. We changed the release location from Long Lake Creek to the Adam's WPA, about three miles away, and remedied the situation.

As of this writing, we have received band returns on five ducks (3 BWT, 2 mallards). The birds were shot by hunters and recovered in Louisianna, South Dakota, Missouri, and Mississippi.

Sex, Age, and Species of Banded Ducks Released from Long Lake NWRs Botulism Recovery Center, 1987

	AHY-M	AHY-F	HY-M	HY-F	Total
GWT	61	23	6	8	98
BWT	44	14	29	18	105
Shoveler	6	1	4	6	17
Pintail	40	22	6	16	84
Gadwall	7	2	4	1	14
Mallard	18	4	2	7	31
Wigeon	1	1	2	0	4
Redhead	1	0	0	0	1
Canvasback	1	0	0	1	2
Total	179	67	53	58	357

Part of the recovery effort involved getting fresh water into the stricken birds. (87-MWG)

H. PUBLIC USE

1. General

Public use at Long Lake NWR is primarily centered around fishing, hunting, wildlife observation and wildlife photography. The refuge staff promotes the work of the Service not only in our routine answering of questions and letters, but by putting on programs that deal with refuge activities, wildlife management, and natural resources. Programs given in 1987 included:

a. Knode assisted in a duck identification workshop in Bismarck.

b. Goos gave an artic fox control - Aleution Island talk at the Kensal Wildlife Club.

c. Hanley presented a wildlife week talk at the Steele Grade School.

d. Goos served as science fair judge at the Hazelton-Moffit High School.

e. McEnroe served as a panel member at the ND Water Users Association Meeting.

f. McEnroe gave a talk concerning the GDU compromise at the ND Annual State Planning Conference.

g. McEnroe gave a talk on the Wetland Trust.

h. McEnroe gave a talk on refuge management to the ND Wildlife Federation.

i. Pierre Bottineau gave a talk to the Hazelton-Moffit High School.

j. Knode gave a talk on Long Lake NWR/WMD to the ND Tourism and Recreation Department.

k. Knode & Goos served as food plot judges for the ND Wildlife Trust.

l. Knode & Goos provided a refuge tour for the Steele Grade School students.

m. Goos provided a refuge tour for the Bismarck High School biology students.

One article on the bale banders provided by the extension program was written and submitted to the "Flickertails".

Refuge staff attended the following in 1987: meeting on piggyback leases on CRP and wetland easement lands; two meetings on alternatives and mitigation for proposed outlets to Devils Lake; meeting of the ND Wetland Trust; two Burleigh County Commissioner and one public meeting on the purchase of the Rath tract; the NDCTWS annual meeting; a seminar at NPWRC on Canvasbacks; meeting on botulism at D.U.; seminar on predator trapping; meeting with the Burleigh County Highway Department; meeting with the area Waterboard; meeting with the Burleigh, Emmons, and Kidder County Commissioners; attended the wetland classification workshop; attended the Savory grazing program; meeting with the Lewis and Clark Wildlife Club; meeting with the ND State Health Department; meeting with USGS; meeting with D.U.; attended the project leaders meeting; meeting with the Mayor of Robinson; meeting with the Burleigh County Engineer; meeting on four-square mile pair counts; and meetings of the Napoleon Wildlife Club.

Bismarck Boy Scouts installing duck baskets on Bryan/Mohler and Clizbe WPA. (87-MWG)

2. Outdoor Classroom - Students

A refuge tour was given to the Steele Grade School (45 students) and a bird watching tour was given to the Bismarck biology class (60 students).

7. Other Interpretive Programs

Tom Gibson who portrays Pierre Bottineau, the early French trapper, was hired to give his presentation to the Hazelton-Moffit Elementary School.

8. Hunting

Long Lake NWR is open for archery, firearm, and muzzleloader deer seasons.

Archery deer hunting accounted for an estimated 40 visits, but no deer were known to have been taken. Firearm deer hunting provided an estimated 400 visits with about 50 deer being taken. Muzzleloader deer hunting accounted for 10 visits and no deer taken.

Firearm deer hunting pressure was very heavy on opening weekend this year and then quickly tapered off. Refuge staff working L.E. opening weekend checked 21 deer during routine patrols.

Waterfowl hunters pass shooting on the refuge boundary enjoyed good goose hunting success opening weekend of waterfowl season and sporadic success the remainder of the season.

9. Fishing

Sport fishing is allowed along Long Lake Creek and in Unit I of Long Lake. There are three public access sites on the refuge and on the creek. Fishing on the refuge was primarily directed toward northern pike and bullheads but occasionally walleye are taken. Fishing success was poor from January thru May, good for bullheads in June and July, poor in August, and excellent for northern pike in September through December. An estimated 2,500 northern pike from 2 to 14 pounds were taken from Long Lake Creek this fall. An estimated 1,200 angles spent 2,400 hours fishing on the refuge in 1987.

10. Trapping

In 1987 there were six trapping permits issued on Long Lake NWR. Four of the permits were for all furbearers except muskrat and two permits were for mink and muskrat. The trapper's total catch was 6 coyote, 5 badger, 8 mink, 3 raccoon, 4 stripped skunk, 1 red fox, and 600 muskrat.

11. Wildlife Observations

Although the refuge does not have a tour route or interpretive trail, all of the county roads that are adjacent to or run through the refuge are used by visitors to view the refuge and wildlife. Throughout the year local residents drive by to view the pheasants, waterfowl and deer. During the summer, several groups or families stop by each week while on vacation.

Long Lake personnel conducted two Christmas Bird Counts on Long Lake NWR and the surrounding areas in 1987. The 1986 count was done on January 2 and was the first count ever run on the refuge. McEnroe and Goos ran the route and compiled 1,306 individuals from 18 species. This count recorded the greatest number of ring-necked pheasants (644) seen on any ND count in at least the past 20 years.

Four people participated in the 1987 count on December 17. A total of 723 birds from 15 different species were observed.

12. Other Wildlife Oriented Recreation

During the year several amateur photographers visited the refuge.

Photo blinds are allowed by permit. Occasionally we see a photograph that was taken on the refuge.

The refuge has an observation/photo blind on a sharp-tailed grouse dancing ground. The blind is large enough to accommodate two seated adults. Use of the blind was on a reservation basis only and was filled almost every day in April and May. People who used the blind were extremely complimentary and regarded it as a very valuable outdoor experience.

13. Camping

Camping is not allowed on the refuge.

14. Picnicking

There is a stone picnic shelter on the "Butte" on the west end of the refuge which is occasionally used. It was built by the CCC in 1938 from field stone. There is not any drinking water or toilet facilities on the refuge.

15. Off-Road Vehicling

There is no off-road vehicling allowed on the refuge.

16. Other Non-Wildlife Oriented Recreation

Occasionally the refuge staff receives (and grants) a request to pick wildflowers, cattails, curled dock, or other dried plants. These visits had little impact on wildlife and are appreciated by the public.

17. Law Enforcement

Refuge officers Knode and Goos attended the 40 hr. L.E. Refresher Course held in Bismarck, ND and a one day course held in Valley City, ND. Knode served as a firearms instructor for both sessions. The Long Lake NWR, Long Lake WMD and the satellite refuges were patrolled regularly from the start of waterfowl season through deer season. It appeared that waterfowl and upland bird hunting pressure was similiar to last year. Six violation notices were issued this year.

Date	Violation	Disposition
12/23/86	Unlawful Trespass on a refuge	$35.00 fine
12/23/86	Unlawful Trespass on a refuge	$35.00 fine
10/3/87	Attempt to take migratory game bird in excess of daily bag limit	$50.00 fine
10/3/87	Attempt to take migratory game bird in excess of daily bag limit	$50.00 fine
10/3/87	Taking migratory game bird in excess of daily bag limit	$150.00 fine
10/4/87	Taking migratory waterfowl without a validated Federal migratory bird hunting and conservation stamp	$50.00 fine
10/27/87	Entering an area on a wildlife refuge closed to public access	$35.00 fine
10/27/87	Entering an area on a wildlife refuge closed to public access	$35.00 fine

The cases which occurred on 12/23/86 were processed in 1987. The cases were made when a photographer who was in a photo blind on the refuge photographed two individuals illegally hunting on the refuge. A license plate number and personal description were obtained from the photo which led to the citations. The photographer was nominated for and received a RAP (Report All Poachers) reward.

We filled out hunter report cards on waterfowl hunters observed in 1987. Information was gathered on 74 hunters who bagged 43 ducks and 7 geese (.68 bird/hunter). It appears that the hunters observed did not fare well.

I. EQUIPMENT AND FACILITIES

1. New Construction

The Ducks Unlimited contractor continued work on the Unit II marsh project. (See section F).

A new duck hospital was built in August at the old headquarters site. The new facility has two enclosures each with a pond and running water, plus a storage room and work area. We can now store all our supplies and ducks in one place, which will make for a more efficient duck treatment operation. Long Lake staff assisted Jerry Wolsky and Jim Somsen, Arrowwood NWR, in construction of the new hospital.

Arrowwood Complex personnel pouring concrete for the new duck hospital. (87-MWG)

The completed duck hospital. (87-JDK)

In November R&W Enterprises built a new seven stall pole barn to replace the six stall garage that was destroyed in a wind storm in 1986. The new building is larger than the old one (32'X 100') and can store the majority of our equipment.

The new & improved pole barn. (87-MWG)

Jim Somsen, Arrowwood NWR, spent about two weeks at Long Lake NWR working on various dirt projects. Most of the projects were maintenance of existing structures. However, a new dam was also built in Unit 12b.

Volunteer Dan Svinger constructed a predator fence on a small peninsula in G-16 on the east end of Unit III. The fenced peninsula now called Pintail Point will be trapped and the fence electrified during nesting season. This will create a 17 acre nesting island in one of the most productive areas of the refuge.

3. Major Maintenance

Jim Somsen, Arrowwood NWR, completed the following projects:
- Repaired washed out dike in Unit G-19a
- Repaired dam in Unit A-10
- Repaired four dams in Units G-4a, b, and c
- Expanded the gravel pit
- Buried old farmstead foundation on Unit G-5

Long Lake crew repaired an old CCC dam in Unit G-19a that was build in the 1930's. A hole underneath the concrete was filled with a big sheet of plastic and was used to cover the spillway and stop further leakage. The plastic was then covered.

In December a breach in "A" dike, caused by the high water was filled with gabion as a temporary measure to handle the 1988 spring run-off. Rock was added to keep water from washing around the gabions.

A-dike was repaired with gabions. (87-SAK)

4. Equipment Utilization and Replacement

Long Lake NWR/WMD received two new Honda 4X4 ATVs in June. They were purchased primarily for nest dragging but have proven useful in many other duties including botulism patrol, fence repair, filling artifical nesting structures, and easement evaluations.

The 1986 Chevrolet 1-ton pickup blew a transmission in May. Fortunately the truck was still under warranty and we did not get stuck with the $1,300 bill.

The 1979 Stoessel airboat developed more problems this year. Trouble with oil lines and another cracked propeller (its on its 4th propeller) sidelined the boat for about a week of repairs. Modifications and improvements are planned for this boat to prepare it for next year's botulism patrols.

The Arrowwood Complex airboat, a 1986 Panther, was on duty at Long Lake NWR for the entire botulism season. This boat is excellent for botulism clean-up and being able to run two boats all summer increased the effectiveness of our clean-up operations dramatically.

J. OTHER ITEMS

1. Cooperative Programs

Long Lake staff records daily and monthly weather conditions for the National Weather Service.

3. Credits

Steve Knode wrote sections A, B, C, D, & K. Mike Goos wrote sections F & H. Alice Hanley wrote E, G, I, & J. Steve Knode and Dave Stearns edited the report and Mary Liberda and Doris Messmer, Arrowwood NWR, typed the report. Credits are given for each photo.

K. FEEDBACK

I will keep it brief.

It is great to be back in North Dakota again.

The current revenue sharing payments may stop land acquisition in North Dakota in it's tracks.

Refuge Complex's are under staffed and under funded.

The Conservation Reserve Program will have a long lasting, positive impact on wildlife in North Dakota. We should keep predator populations at their current level so the ducks can rebound quickly and take full advantage of the new nesting habitat.

Lead shot poisoning of waterfowl will soon be under control. The momentum is swinging now toward disease problems which will save hundreds of thousands of ducks annually. Sure it will be expensive but isn't a duck saved worth as much as a duck raised?

Our neighboring Region to the east is often viewed as having too many people and too much money. They do <u>not</u> have too many and too much, we have too few and not enough.

The Fish and Wildlife Service has many outstanding people in its ranks but North Dakota seems to have more than its fair share. I am convinced that most of these people have enough grey matter between their ears to be successful in any profession they might choose.

It seems that there is no shortage of drive or determination either. This really sank in when after many long days of typical spring time activity one of my people apologetically asked to be able to go home on time the next day. The people I work with at Long Lake are some of the best and I am proud to be their supervisor.

Steve Knode

Long Lake WMD

LONG LAKE WETLAND MANAGEMENT DISTRICT

Moffit, North Dakota

ANNUAL NARRATIVE REPORT

Calendar Year 1987

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

INTRODUCTION

The Long Lake WMD is located in the south central North Dakota counties of Burleigh, Emmons, and Kidder. The district is administered by the Long Lake NWR and covers two Fee Refuges (Slade NWR - 3,000 acres and Florence Lake NWR - 1,920 acres including 132 acres of meandered lake), 71 WPAs totaling 18,333 acres, 938 easement contracts on 95,634 acres and six easement refuges (Canfield Lake, Appert Lake, Hutchinson, Lake George, Springwater, and Sunburst).

The Long Lake WMD headquarters is located on Long Lake NWR near Moffit, North Dakota which is about 35 miles southeast of Bismarck.

The topography of the area varies from coteau to Missouri River slope. Temperatures are temperate for North Dakota and precipitation averages just under 16 inches per year.

TABLE OF CONTENTS

G. WILDLIFE

H. PUBLIC USE

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

A. HIGHLIGHTS

The Long awaited purchase of the Rath Tract came to be in December. The 1,838 acre WPA is one of the finest pieces of real estate in the district and is typical of the best of the North Dakota Coteau Region. (Section C 1).

A botulism outbreak occurred on several areas on the district including the Dewald Slough in Kidder County. The Kleppe-Lang WPA occupies a corner of this slough where 3700 birds were estimated to have been lost. (Section G 17).

Thirty-six haying permits were issued covering 1,471 acres. These tame grass fields were disced and/or interseeded with alfalfa and sweetclover. (Section F 5).

As a result of the CRP "piggyback" program, interest was generated in FWS easements. Thirty-one easement evaluations were done by the refuge staff covering about 134 quarters of land. (Section C 2).

B. CLIMATIC CONDITIONS

See Long Lake NWR narrative.

C. LAND ACQUISITION

1. Fee Title

In December of this year the 1,838 acre Rath Tract became the Rath WPA. There is a one year land use agreement so posting and management of the area will have to wait another year. This area was purchased for $316,000 and will make an excellent addition to the Long Lake Wetland District.

An environment assessment was written for the proposed acquisition of the Slovarp Tract. This 160 acre block is in the McKenzie Slough area and adds to our protection to this valuable area.

BLM tracts were reviewed again this year for possible transfer to Fish and Wildlife Service jurisdiction. Forty parcels of land were reviewed in 1986 with 25 being judged as suitable wildlife habitat that we would like to manage. To date none of these tracts have been transferred.

2. Easements

With the advent of the Conservation Reserve Program and the FWS "piggyback" lease program, interest in wetland easements was high this year. The Long Lake staff evaluated and/or

ground checked 31 tracts covering more than 134 quarters. To date, only one has been purchased.

D. PLANNING

2. Management Plan

The WPA maintenance matrices designed to keep track of the work needed, planned or completed is working well. A new folder is being designed by Don Hultman of Valley City and Roger Hollevoet of Devil's Lake to replace and add to the old rip card. Our first excercise with this system will be on the Rath WPA in 1988.

E. ADMINISTRATION

1. Personnel

Staffing at Long Lake NWR and WMD were described in the Long Lake NWR narrative. The staff manages Long Lake NWR and the three county wetland management district including: 71 WPAs totalling 18,333.21 acres, 938 easements covering 95,634 acres, Slade NWR (3,000 acres), and Florence Lake NWR (1,788 acres). Canfield Lake, Hutchinson Lake, Lake George, Sunburst, Appert Lake, and Springwater easement refuges are also administrated from Long Lake Refuge.

4. Volunteer Program

Three paid ($10/day) FWS volunteers; Don Lantz, Chad Maier, and Dan Svinger were on staff in 1987. They were a valuable addition to our staff and with their help we were able to accomplish many projects on Long Lake NWR/WMD. In addition, three locally recruited volunteers, Jennifer Knode, Frank Knode, and Ila Cron donated their time and assistance on refuge and district projects. The six Long Lake NWR/WMD volunteers contibuted a total of 500 hours of work in 1987.

5. Funding

Funding for Long Lake WMD is included in the budget for the Arrowwood Complex and is described in the Long Lake NWR narrative.

6. Safety

The Safety Section is described in the Long Lake NWR narrative.

7. Technical Assistance

See the Long Lake NWR narrative.

F. HABITAT MANAGEMENT

1. General

The WMD, Florence Lake NWR plus six easement refuges, and the easement contracts are managed primarily for waterfowl production. Other migratory and resident wildlife species also benefit.

The WPAs consist of approximately 34 percent wetlands, 35 percent native grass, 14 percent tame grass, 12 percent DNC, 4 percent cropland, and 1 percent woodlands.

No water control structures exist on the WPAs. Small wetlands for pair habitat are created on the WPAs and satellite refuges by constructing small dams or plugging old drainage ditches whenever possible.

Native grasslands are managed by prescribed burning, grazing, or haying. Tame grasslands are managed by haying, interseeding, scarification, or when possible by converting to DNC. DNC fields are managed by interseeding, scarification, or by farming and planting back to DNC.

2. Wetlands

Wetlands were in good to excellent condition following spring run-off. They remained in good condition until early fall and then dried rapidly. Only 0.75 inches of moisture was received in the last four months of 1987. At freeze-up soil moisture was in short supply and most temporary and seasonal wetlands were dry. Good run-off will be needed to fill PEMAs and PEMCs this spring.

Several dam sites were identified in 1987 and hopefully work can start in 1988.

3. Forest

The four acre 1986 tree planting on Schatz WPA was again cultivated by a neighboring landowner. The planing has received good care and is showing good growth.

The 1985 five acre tree planting on the Bechold WPA continued to receive excellent care from the adjacent landowner and the trees are well established.

The 4.4 acre 1987 tree planting on the Walther WPA continued to be under the care of the Linton Sportman's Club. Four replacement rows were planted this year.

As part of a mitigation package at Scheirmeister WPA, the ND State Highway Department planted approximately 180 caragana

and buffaloberry in 1985. The trees have received little care and are doing fair.

4. Cropland

Farming was used to establish wildlife food plots and to prepare fields for planting DNC. Except for a small amount of force account farming on the WPAs, all work was done by cooperators. Five WPAs have wildlife food plots and nine are being farmed for DNC establishment as summarized below.

WPA	Acres	DNC Scheduled	Coop. Share	WMD Share
Food Plots				
Schiermeister	25.0		18.75 SG	6.25 C
Bechold	16.0		8.0 O	8.0 C
Basaraba	95.0		84.0 W	11.0 C
Victor	45.0		30.0 SG	7.5 B
				7.5 B(baled)
Crimmins	77.2		53.7 SG	17.0B(baled)
				6.5 SG
Preparation for DNC				
Weiszhaar	25.0	1989	25.0 SG	
Kleppe/Lang	30.0	1988	30.0 SG	
Adams	53.0	1987		53.0DNC*
Basaraba	28.0	1989	7.0 O	5.0 O(baled)
"	40.0	1989	35.0 O	5.0 O(baled)
Crimmins	28.0	1988	28.0 SG	
"	23.0	1987	23.0 O	23.0 DNC
Mayer	53.0	1987	53.0 O	53.0 DNC*
Sisco-Fallgetter	53.1	1988	53.1 SG	
"	68.0	1987	68.0 O	68.0 DNC*
"	44.0	1990	44.0 H/B	
YMCA	36.0	1990	36.0 H/B	
Nelson	36.0	1990	36.0 H/B	

SG=Small Grain, C=Corn, O=Oats, B=Barley, H/B= Hay/Break, W=Wheat

* Planted force account.

Old tame grass fields were broken out on the Sisco/ Fallgatter, YMCA, and Nelson WPAs. These fields are all scheduled for DNC in 1990.

The DNC planted the Kurtz WPA in 1986 was evaluated in 1987 and appears good.

5. Grasslands

Grasslands were in good shape in the southern two-thirds on the district in 1987. A late May hot spell hurt grasses in northern Burleigh and northern Kidder Counties. In general it was a good legume year with good stands of volunteer clover. Several hay requests were received from the northern portion of the district. We were able to trade hay for work on 23 acres.

Grassland evaluations were completed on all hayed areas. Prior to issuing the permits, Daubenmeir transects were done. Kleppe/Lang, Kurtz, Crimmins, and Bechold WPAs had hay permits. Plans were also made to do two native grass burns; one on Crimmins WPA and one on Wonnenberg WPA. However, only the Crimmins WPA burn was completed.

6. Other Habitats

The experimental brush planting on the one acre D.U. island on Thacker WPA was weeded three times. The woody plants are alive but show very little growth.

7. Grazing

There were no grazing permits issued on the WPAs in 1987.

8. Haying

Haying permits are generally issued to cooperators in exchange for grassland rejuvenation work. The work needed is determined by a grassland evaluation and usually consists of discing or interseeding three pounds of alfalfa and one pound of sweetclover. The cooperator generally is given the hay after the 15th of July and completes either the discing or the interseeding as early as possible on the tract the following spring.

Four haying permits were issued this year on native prairie. The cooperators were required to hay after the end of August and were required to use a rake. The four tracts are difficult to burn or graze and it is hoped that the late haying/raking will remove litter and decrease fall growth by Kentucky blue grass. Daubenmeir transects were conducted on these areas.

In 1986 we issued nine haying permits that required the cooperators to do work in the spring of 1987. All cooperators completed the required discing or interseeding as follows.

WPA	Acre	Treatment by Coop.	Result
Crimmins	58.0	Discing	Fair increase in legume
Bernhardt	58.0	Discing	Good increase in legume
Vogel	18.0	Discing	Fair increase in legume
Basaraba	9.0	Discing	Poor legume response
Lend	11.0	Interseed	Unknown catch
ND 2 (Crystal Springs)	35.0	Interseed	Fair catch
Almer	35.0	Discing	Good legume response
Bechold	12.0	Discing	Unknown result

In 1987 23 haying permits were issued on the WPAs. Nineteen required work to be done in the spring of 1988.

WPA	Acres	Treatment by Coop.
ND - 2	35.0	Interseed
Kleppe	32.0	Discing
Mayer	28.0	Discing
Kleppe/Lang	30.0	Litter removal
Bechold	80.0	Litter removal
Bernhardt	15.0	Interseed
Crimmins	46.0	Discing
Crimmins	35.0	Discing
Victor	26.0	Discing
Neustel/Whitman	70.0	Discing
Crimmins	35.0	Litter removal
Crimmins	35.0	Litter removal
Oswald	30.0	Discing
Oswald	30.0	Discing
Albright	50.0	Discing
Whitman	65.0	Discing
Vogel	23.0	Discing
N. Crimmins	30.0	Discing
Personius	51.0	Discing
Small	40.0	Discing
Goldsmith	42.0	Discing
Albright	40.0	Interseed
Kurtz	31.0	Litter removal

9. Fire Management

Prescribed burns were planned for a 140 acre native grass-forb tract on the Crimmins WPA and a 90 acre tract of the Wonnenberg WPA. Fire breaks were prepared on both tracts, but only the Crimmins burn was completed. The burn was completed on May 6, 1987. By this fall there appeared to be a good response by the native grasses and forbs.

10. Pest Control

Leafy spurge patches were sprayed with 2-4,D/Banvel mixture on the Berg-Gellner WPA (0.3 acre), Schiermeister WPA (0.1 acre), Guthmiller WPA (3.0 acres), Hoot-Gaub WPA (3.1 acres), Kleppe WPA (0.01 acre), Bechold WPA (0.1 acre), and Personius WPA (2.0 acres).

12. Wilderness and Special Areas

A site on the Kleppe/Lang WPA has been identified by the ND Natural Resource Ecologist as habitat for (Liparis loeselii) Loesel's twayblad orchid. This area is one of four known ND sites and will be protected.

13. WPA Easement Monitoring

Easement inspection flights postponed from the fall of 1986 were conducted in the spring of 1987 and revealed fourteen possible violations. After ground checking only one violation required a landowner contact. One violation was carried over from 1985 and another violation was carried over from 1986. These three were all satisfactorily restored in 1987.

Easement	County	Violation	Discovered	Outcome
332X	Kidder	Fill	11/85	Restored by 10/87
229X	Burleigh	Ditch/Fill	3/86	Restored by 6/87
165X	Kidder	Fill	4/87	Restored by 10/87

Mallard nest discovered while checking fill on Kidder 165X. (87-SAK)

Easement inspection flights were flown in November of 1987 and 15 possible violations noted. After ground checking the following actions were taken:

Easment	County	Violation	Discovered	Outcome
23X	Burleigh	Burn	11/87	Letter sent 12/7/87
145X	Emmons	Ditch	11/87	Restored 12/22/87
217X	Emmons	Ditch	11/87	Restored 12/17/87
77X-1	Emmons	Burn	11/87	Letter sent 12/7/87
30X	Emmons	Burn	11/87	Letter sent 12/7/87
133X	Kidder	Burn	11/87	Letter sent 12/7/87
495X	Kidder	Burn	11/87	Letter sent 12/7/87

In addition, a violation was discovered on Kidder easement 46X while working on a flooding problem with an adjacent landowner. This violation involves several ditches and fills, and a past violation. It will be addressed next spring.

Plow furrow drains on Emmons 145X.
(87-MWG)

Shallow ditch on Emmons 217X.
(87-MWG)

G. WILDLIFE

1. Wildlife Diversity

The unmanned refuges, WPAs, and wetland easements, although managed primarily for waterfowl production, furnish good habitat for upland game, big game, and other wildlife. The refuges and WPAs contain a wide variety of marshes, lakes, native and tame grasslands, woodlands, and food plots.

Most of the wildlife observations in the WMD are made incidental to other work.

2. Endangered and/or Threatened Species

A peregrine falcon was observed north of the Adams WPA in Burleigh County on December 14, 1987.

Bald Eagles were observed on or near the Kleppe, Bechold, Plieness, and Foell WPAs during spring and fall migrations.

3. Waterfowl

Waterfowl began migrating into the WMD in mid-March and by the 26th migration was in full swing.

Substantial run-off and May rains filled wetland basis and provided good breeding habitat.

We conducted 4-square mile pair counts on 18 plots in the WMD in mid-May and again in early June. The counts included portions of only five WPAs or refuges. Recruitment was estimated for fee, easement and private tracts in the district. The results are shown in the following table.

Estimated Duck Production
Long Lake WMD 1987

Species	FWS-Fee	Easement	Private
Mallard	1053	7491	11,253
Gadwall	1820	19,085	31,141
Blue-Wing Teal	4368	81,353	136,289
Shoveller	787	10,629	18,303
Pintail	398	6833	14,496

The model did not handle other species and did not breakdown which parts of the WMD did better than others. Our sample plots in Emmons County were in some of the least productive areas while the most productive areas were excluded.

Refuge staff nest dragged two areas, the Lake Harriet electric fence peninsula cutoff and Harker Lake peninsula on Slade NWR for the NPWRC Point/Island Study. (See Section D 5).

In addition, the refuge staff checked islands on several WPAs for nests. A dramatic increase in the number of nests on our four man-made islands was observed in 1987. Fifteen nests were found on Personius, 13 on Thacker, 7 on Almer, and 1 on Sisco/Fallgatter WPA. Species were; mallard 12, gadwall 9, shoveler 5, blue-winged teal 4, wigeon 2, pintail 2, and unknown 3. All were found on one search.

Natural islands on three WPAs were also checked for nests. One mallard nest was found on the Crystal Springs WPA. Nineteen islands on or near the PDL 1 and 1a WPAs had a total of 94 duck nests, 6 Canada goose nests and 13 cormorant nests. The nesting species was gadwall 21, mallard 17, pintail 6, blue-winged teal 5, scaup 5, shoveler 4 and unknown 36. The water was extremely shallow so with lower water this area may not be as productive but we will still monitor it since it is an important area.

The islands were not rechecked due to lack of time and man power, but the majority of nests are assumed to have hatched. This is based on the very limited depredation observed on the islands.

Aerial view of PDL 1 and 1A where impressive nesting occurred. (87-MWG)

Canada goose pairs or nests observed were: Crimmins WPA 2 pairs; Foell WPA 1 pair w/brood; Kleppe-Lang WPA 2 pairs; Adams WPA 1 nest; and PDL 1 and 1a 6 nests.

By mid-September migrants were moving into the district. Peak populations were rather low this year with 13,150 ducks, 2000 Canada geese, 20 snow geese, and 200 tundra swans. These numbers show a major decline over the last several years.

4. Marsh and Water Birds

Although no formal censuses are conducted for these species, Long Lake staff commonly observed black-crowned night herons, great blue herons, white pelicans, Americn bitterns, double-crested cormorants, western, eared, and pied-billed grebes.

Approximately 200 cormorant nests were active on the Lake Harriet peninsula in Burleigh County. This is up from last year's count of 50 which were recorded when the electric predator barrier was installed. An eared grebe colony with 150 nests was observed on the Mattern WPA in Emmons County.

Sandhill cranes began to arrive in August and populations, increasing until October. The majority of the cranes were found in Kidder County.

5. Shorebirds, Gulls, Terns, and Allied Species

No formal censuses of these species are conducted. The most common species is killdeer, American avocet, Wilson's phalarope, ring-billed gull, and Franklin's gull. Sandpipers and yellowlegs are abundant during spring and fall migration.

6. Raptors

Northern harriers are the most abundant raptor. Red-tailed, Swainson's and ferruginous hawks also are common nesters. Great-horned, short-eared and burrowing owls are also present.

Uncommon and unusual sightings include golden and bald eagles, prairie and peregrine falcons and snowy owls.

7. Other Migratory Birds

The staff conducted two mourning dove coo-counts, one in Burleigh and one in Kidder County. Results indicate a large increase in the number of calls over 1986. A total of 103 doves were heard in 1987 compared to 70 in 1986.

8. Game Mammals

Whitetail deer are found on most of the units. The lack of snow cover prevented the aerial deer survey. No problems with depredation or starvation were reported in 1987.

10. Other Resident Wildlife

Ring-necked pheasants, sharp-tailed grouse and gray partridge are found on many of the WPAs and refuges. Ring-necked pheasants are found on most of the WPAs and refuges in Burleigh and Emmons Counties and a few in Kidder County. Wild turkeys were observed for the first time on the Crimmins WPA in Burleigh County and on Slade NWR in Kidder County.

Whitetail jackrabbits, mink, muskrat, raccoon, striped skunk, coyotes, red fox and badger are also common.

As the amount of CRP acres increases, the benefits to resident wildlife, as well as migratory birds, should become apparent. (Section E 4).

11. Fishery Resources

There are no sport fisheries in the WMD. A few carp and minnows are found on Schiermeister WPA in Emmons County.

12. Wildlife Propagation and Stocking

Wood duck nesting structures were checked on the Schiermeister WPA (3), Kurtz WPA (2), and Schatz WPA (3). No use was recorded.

Alice Hanley checking wood duck baskets on Kurtz WPA. (87-MWG)

There were 23 useable goose baskets on the WPAs in 1987. Six of there baskets were used by Canada geese and 5 of the baskets were used by mallards.

15. Animal Control

Private trappers were active on the WPAs this year. Permittee trappers were selected for five of the refuges in the WMD.

Also, Long Lake personnel placed conibear traps on electric fence peninsula cutoffs at Lake Harriet and Des Moines Lake. We removed one skunk and one raccoon from the Lake Harriet area.

Refuge staff trapped the four islands on the Personius, Almer, Thacker, and Sisco/Fallgatter WPAs using conibear traps. No animals were removed.

In addition, conibears were used along the road ditch at the Sisco/Fallgatter WPA. Two skunks and two raccoons were removed.

17. Disease Prevention and Control

This year was a bad year for botulism with outbreaks in eight locations. In late July we received reports of dead birds in southern Emmons County. Historic botulism problem areas were checked and 21 dead ducks were picked up in the Nieuwsma dam area. About that time we learned that the ND Game & Fish Department had begun picking up birds on their Rice Lake Wildlife Management Area in Burleigh County. In early August we received reports of dead birds on Thorsness Lake (private), southwest Dewald Slough (private) and the Dewald Slough/Kleppe/Lang WPA area (65 percent private, 35 percent WPA), all in Kidder County. Botulism clean up began immediately and lasted until mid-September on the worst areas.

Botulism outbreaks on three additional areas, North Dakota #2 WPA in Burleigh County, Lake Etta (private), in Kidder County and Stoney Slough (private) also in Kidder County, were discovered by hunters in early October after the botulism had run its course. No clean up operations were conducted on these areas.

We would like to thank the ND Game & Fish Department and the Arrowwood NWR/WMD for their valuable help on botulism clean up.

Alice is smiling for the camera. Picking up the wasted waterfowl is grim work. (87-MWG)

Botulism Losses 1987 - Long Lake WMD

Location	Ducks	Other Birds
Dewald Slough/Kleppe/Lang WPA (65% private, 35% WPA) Kidder	813	437
Southwest Dewald Slough (private, Kidder)	1373 total birds	
Rice Lake WMD State Owned (Burleigh)	2496 total birds	
Thorsness Lake (private, Kidder)	3102 total birds	
South Nieuwsma Dam (private, Emmons)	21 ducks	
North Dakota # 2 WPA Burleigh	6000 total birds est.	

Lake Etta (private, Kidder)	5400 total birds est.
Stoney Slough (private, Kidder)	6750 total birds est.

H. PUBLIC USE

1. General

Long Lake WMD does not have any interpretive trails, routes, or exhibits. Public use is mostly associated with hunting, fishing, wildlife observation, trapping, and wildlife photography. In this area the WPAs are virtually the only public federal land and provide an important opportunity for public access. WPAs located on county roads are visited on a frequent basis by people observing wildlife. Most of the walk-in use is by hunters and trappers. Presentations given and meetings attended by Long Lake staff are discussed in the Long Lake NWR narrative.

8. Hunting

All of the WPAs except one in Long Lake WMD are open to hunting. Most of the WPAs receive at least moderate use. Hunting pressure on the WPAs is generally greatest for ducks and deer, moderate for upland game birds, and low for predators and other small game.

This year, hunter success was fair to good for pheasants, sharp-tailed grouse, and gray partridge. Waterfowl hunters did not fare well as low duck numbers contributed to their lack of success.

Deer numbers in ND continue to be extremely high and a near record number of permits was authorized. In order to get all the permits issued the ND Game & Fish Department allowed hunters to purchase an additional doe tag in the eastern portion of the state. Hunters who were willing to walk the WPAs did well. Most would not go to the effort.

Predator hunting continues to be a popular sport in the WMD and most WPAs are walked or called sometime during the winter. Hunter success varies greatly, but overall predator numbers seem to remain stable.

9. Fishing

No fishing occurs in the WMD.

10. Trapping

Most of the WPAs receive some trapping use. Muskrats are the most sought with other furbearers a distant second.

11. Wildlife Observation

Most wildlife observation occurs on WPAs near Bismarck and on those with good road access. Occasionally people are seen hiking, bird watching, or looking for wildflowers.

12. Other Wildlife Oriented Recreation

A small amount of wildlife photography is done on the WPAs.

15. Off-Road Vehicling

None of the WPAs or refuges in the WMD are open to off-road vehicling. Vehicle use restrictions have been posted on all areas.

17. Law Enforcement

Most of the law enforcement efforts in the district center around consumptive wildlife activities and are reported in the Long Lake NWR narrative. This fall Sisco/Fallgatter WPA, Nelson WPA, Albright WPA, Vogel WPA, Guthmiller WPA, Martin WPA, Crimmins WPA, and Almer WPA were posted with signs warning hunters about the presence of canvasbacks and redheads.

I. EQUIPMENT AND FACILITIES

1. New Construction

The mild weather allowed the staff to do some fencing in December. A fence and gate were constructed at the trail leading to the farmstead of the recently acquired Rath WPA in Burleigh County.

Vehicle trespass problems were addressed by beginning construction on a fence, parking area and gate on the Bechold WPA in Kidder County. The fence will be completed next summer when time allows.

3. Major Maintenance

In April we worked with Ducks Unlimited and NPWRC personnel to put the finishing touches on the electric fences on the Des Moines Lake and Lake Harriet peninsula cutoffs. The extension panels in the lake were removed from both fences in October to avoid ice damage.

These fences were built in 1986 but this was the first year they were "hot".

4. Equipment Utilization and Replacement

See Section I 4, Long Lake NWR narrative report.

J. OTHER ITEMS

4. Credits

Steve Knode wrote sections A, B, C, D, & E. Mike Goos wrote section F, H, & K. Alice Hanley wrote sections I & J. Steve Knode and Dave Stearns (ARD) edited the report and Mary Liberda and Doris Messmer (ARD) typed the report. Credits are given for each photo.

K. FEEDBACK

On April 1, 1973 Slade NWR and Slade WMD were absorbed into Arrowwood Complex with management responsibility given to the staff at Long Lake NWR. Prior to 1973, Long Lake NWR generally had a full time staff of three or four which included a manager, a clerk, and one or two maintenance/laborers.

Currently Long Lake NWR/WMD has a permanent staff of four similar to historic levels. So whats the gripe? The gripe is that now in addition to Long Lake NWR the staff has responsibility for what I believe in the fourth largest WMD (based in fee acreage) in North Dakota. Its no wonder there's never a shortage of work to be done.

One brighter note, it sure is enjoyable to be in the WPA and wetland easement acquisition business in North Dakota. At Long Lake WMD in the past two years we have been asked to evaluate nearly 200 quarters for a wetland easement, have purchased a 1830 acre WPA and a 160 acre tract awaits only the Governor's signature, and have several more fee tracts to look at. I realize there are varying opinions about the biology politics that have occurred here over the past few years, but looking at the change in political climate from the grass roots WMD level is certainly positive.

Mike Goos

Slade NWR

SLADE NATIONAL WILDLIFE REFUGE

Dawson, North Dakota

ANNUAL NARRATIVE REPORT

Calendar Year 1987

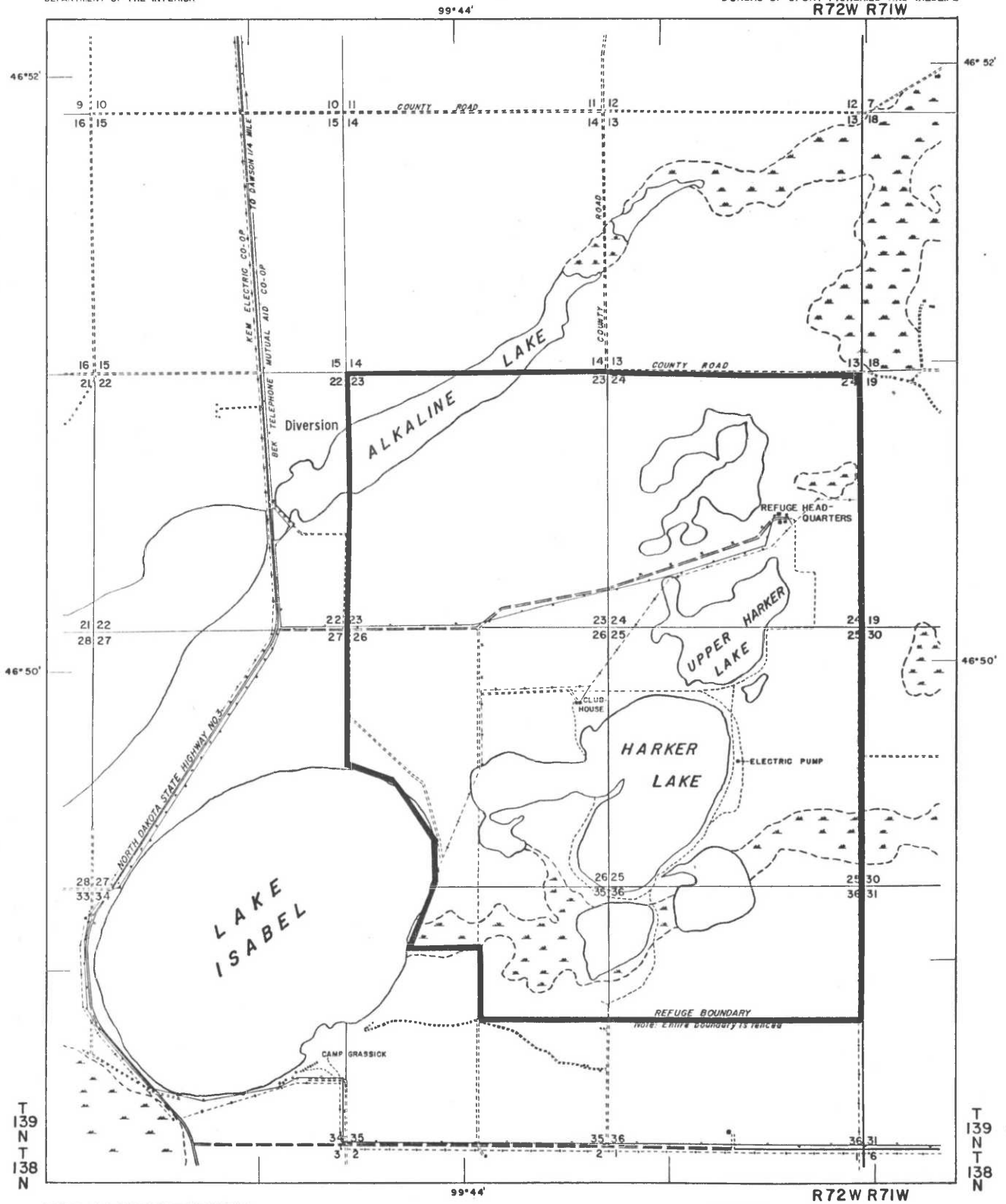
U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

SLADE NATIONAL WILDLIFE REFUGE

KIDDER COUNTY, NORTH DAKOTA

UNITED STATES
DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE



COMPILED IN THE BRANCH OF ENGINEERING
FROM OFFICIAL PLATS OF THE B.L.M AND
FROM SURVEYS BY THE U.S.G.S. AND B.S.F.&W.

MINNEAPOLIS, MINNESOTA MARCH, 1960

FIFTH PRINCIPAL MERIDIAN

Scale 20 0 20 40 60 CHAINS
1/4 0 1/4 1/2 3/4 MILES

TOWNSHIP DIAGRAM

MEAN DECLINATION 1960

3R N.D. 394 408

A. HIGHLIGHTS

A new species was recorded on Slade NWR this year; a flock of eight Merriam's turkeys. (Section G 1).

High water levels and ice action damaged 14 of the available 35 goose nesting structures. (Section G 3).

Spring run-off damaged one dike and breached a second. (Section I 3).

B. CLIMATIC CONDITIONS

See Long Lake NWR Narrative.

D. PLANNING

2. Management Plan

The Annual Water Management Plan was submitted.

E. ADMINISTRATION

See Long Lake NWR Narrative.

F. HABITAT MANAGEMENT

1. General

The refuge consists of gently rolling terrain developed from Missouri Coteau glacial outwash. There are 975 acres of wetland, 200 acres of native grassland, 1,145 acres of tame grass, 30 acres of woodland, 15 acres of roads/trails, 2 acres of building sites, and 633 acres of farming units.

2. Wetlands

Most of the wetland acres are Type V lakes. A few natural Type I's and III's exist in the northern part of the refuge. Several dugouts and ponds have been created in the central part of the refuge.

Slade NWR wetlands were in good to excellent condition following above average spring run-off. The Type V lakes reached flood stage and dike number one was breached between Harker Lake and SE slough. Dike number two received only minor damage between SE slough and south marsh and remained functional. Uplands between North Harker Lake and Harker Lake and between Harker Lake and south marsh were over topped and remained submerged throughout the spring and summer.

Refuge staff spent one day at Slade NWR brainstorming ideas to improve Slade NWR wetlands for waterfowl. Most of the discussion centered on pair ponds, brood habitat, and replacing number three dike.

3. Forests

A five acre field in A-2 was summer fallowed to prepare the area for tree planting in 1988.

4. Cropland

The farming program at Slade NWR provides food for migratory waterfowl and resident species, prepares fields for planting to DNC, and provides a source of alfalfa seed. Two cooperators farmed 368.8 acres and harvested alfalfa seed from 40.6 acres. The remaining acres are planted to DNC.

The refuges share of the crop in 1987 was 10.4 acres of baled oats, 35.2 acres of standing wheat, 36.0 acres of baled barley, 7.4 acres of baled alfalfa, and 900 pounds of cleaned and bagged alfalfa seed. In addition, the two cooperators seeded 19.5 acres of alfalfa, broke out 60.7 acres, and summer fallowed five acres.

5. Grasslands

The majority of the grassland on Slade NWR is either brome, brome/alfalfa, or DNC. Native prairie exists in the northeast corner and adjacent to the marshes. Grasslands on Slade NWR are managed by burning or by haying in exchange for discing or interseeding.

6. Other Habitats

There are three wood duck nesting structures and approximately 35 goose tubs erected on Slade NWR.

8. Haying

In 1986 three hay permits totalling 175.0 acres were issued in exchange for grassland rejuvenation work to be done in the spring of 1988. Two of the permits require the cooperators to interseed alfalfa and sweetclover in brome fields and two of the permits are for discing fields to enhance a weak stand of alfalfa/brome.

One permit was issued for mowing the road ditches and the recreation area.

10. Pest Control

Approximately 25 acres of leafy spurge was sprayed with a mixture of 2-4,D and Banvel.

13. WPA Easement Monitoring

See Long Lake WMD narrative.

G. WILDLIFE

1. Wildlife Diversity

The marshes and uplands support a wide variety of migrant and resident wildlife. Currently, the Slade NWR bird list contains 200 species. Merriam's turkey was added to the list as a breeding species.

3. Waterfowl

The first waterfowl on Slade NWR were observed on March 29, when 50 Canada geese arrived. During the next few weeks waterfowl numbers on the refuge continued to build and by April 15, 46 Canada geese, 85 mallards, 25 buffleheads, 20 pintails, 10 shovelers, 15 goldeneyes, 290 scaup, 55 canvasbacks, 4 ring-necked, 5 wigeons, 5 gadwalls, 15 redheads, 5 common mergansers, and 30 coots were counted. Another count was conducted on May 28 and revealed 120 mallards, 35 scaup, 35 pintails, 100 blue-winged teals, 5 green-winged teals, 5 wigeons, 50 gadwalls, 5 buffleheads, 5 goldeneyes, 15 redheads, 40 shovelers, 10 ruddy ducks, 10 canvasbacks, and 20 coots.

A duck pair count was conducted on June 1 and the results are compared to the two most recent counts showed near average numbers.

Species	1981	1985	1987
Blue-winged Teal	15	8	68
Shoveler	7	23	9
Gadwall	15	18	8
Mallard	15	32	57
Pintail	7	7	1
Wigeon	0	1	2
Green-winged Teal	0	1	0
Redhead	85	27	16
Canvasback	8	6	1
Ruddy	27	0	15
Scaup	21	36	9
Bufflehead	0	0	0
Total Pairs	200	159	186

Only 21 of 35 goose baskets were useable following spring run-off. There were 17 pairs of geese nesting on the 21 baskets. An unknown number of nests were successful. Nest success will be checked late this winter. Several banded

round bales were placed on the edge of wetlands this fall. These will be pushed out on the ice to serve as supplemental nest sites.

Nest dragging results on Slade NWR are discussed under Long Lake WMD Narrative.

Duck production for Slade NWR was estimated at 352. Goose production will likely be about 70.

Slade NWR serves as an important fall migration stop. Fall waterfowl counts revealed:

10/4 - 2,025 Canada geese, 50 mallards, 25 gadwalls, 15 scaup, 15 pintails, 5 blue-winged teal, and 75 coots.

10/14 - 3,006 Canada geese, 4 white-fronted geese, 2 blue geese, 35 tundra swans, 1 wood duck, 58 wigeons, 42 gadwalls, 5 green-winged teal, 1,363 mallards, 1 pintail, 9 shovelers, 42 canvasbacks, 27 redheads, 29 ring-necked, 35 scaup, 51 ruddy ducks and 2,014 coots.

11/9 - 15,000 Canada geese, 4,000 snow geese, 3,000 mallards.

12/3 - 24 mallards, 1 Canada goose.

8. Game Mammals

Whitetail deer utilize Slade NWR on a year round basis. The number of deer varies from 30 to 75. The aerial deer survey was not flown in 1987 due to lack of snow cover.

10. Other Resident Wildlife

Ring-necked pheasant, sharp-tailed grouse, and gray partridge are commonly observed on the refuge.

11. Fishery Resources

Lake Isabel located adjacent to Slade NWR supports a northern pike and fathead minnow fishery. Most years there is a small spring movement of these species into the south marsh. This spring northerns were observed moving into Slade NWR through the breach in dike # 3 and because of high water they had access to all five of the main refuge lakes. Later in the year small fish were observed in the borrow ditches along dike # 2 and dike # 3. The majority of these fish will likely winterkill.

12. Wildlife Propagation and Stocking

Twenty-five ring-necked pheasant hens were transplanted from Long Lake NWR to Slade NWR. These surplus birds were trapped by personnel from the ND Game & Fish Department.

Releasing pheasants on Slade NWR in March. (87-MWG)

H. PUBLIC USE

1. General

A majority of the public use occurs in conjunction with the Lake Isabel recreation area which is located on the refuge.

8. Hunting

The refuge was open to archery deer hunting, gun deer hunting, and muzzleloader deer hunting. A growing number of archers hunt the refuge and visits are estimated at 50. Their kill was one deer. An estimated 120 deer gun hunter visits resulted in 12 deer taken. No muzzleloader deer hunters are known to have hunted the refuge.

9. Fishing

Fishing is allowed from the recreation area adjacent to Lake Isabel and was good for northern pike in May and early June.

10. Trapping

One permit was issued by lottery and the trapper caught five fox, three skunk, 33 muskrats, and one mink.

14. Picnicking

The Lake Isabel recreation area is a popular picnicking area. A new picnic shelter was erected and finished during two years ago by the Kidder County Park Commission. Picnicking visits are estimated at 2,000.

16. Other Non-Wildlife Oriented Recreation

The boat ramp constructed by the Kidder County Park Commission is used by water skiers on Lake Isabel. An estimated 150 boaters used the ramp this year.

17. Law Enforcement

Slade NWR was regularily patrolled during the 1987 hunting season. No violations were observed and no citations were written.

18. Cooperating Associations

In 1985 a 25 year Special Use Permit was granted to the Kidder County Park Commission for a 25 acre recreation area on Slade NWR. The permit authorized daytime use only and the Kidder County Park Commission agreed to maintain a boat ramp, picnicking area, toilets, garbage pickups, and to provide a caretaker for the area. The agreement has worked exceptionally well and the area was heavily used by the public.

I. EQUIPMENT AND FACILITIES

1. New Construction

The new picnic shelter was completed in 1987 by the Kidder County Park Commission.

3. Major Maintenance

Dike number one was breached and dike number two suffered minor damage from spring run-off in 1987. With the help of equipment and personnel from Arrowwood NWR necessary repairs were made to both dikes.

4. Equipment Utilization and Replacement

See Long Lake NWR Narrative.

8. Other

Following the collapse of the six stall equipment shed in the fall of 1986 at Long Lake NWR much of Long Lake's equipment was moved to Slade NWR headquarters for winter

storage. The office/shop and quonset hut are relatively weather proof and storing equipment there worked well.

Sometime in late May/early June the shop was broken into and an air compressor was stolen.

J. OTHER ITEMS

1. Cooperative Programs

On October 14 a Canada goose and tundra swan neck band search was conducted on Slade NWR. No banded birds were observed.

3. Credits

The narrative was written by Mike Goos and edited by Steve Knode and Dave Stearns (ARD). Photo credits are listed in the caption.

K. FEEDBACK

See Long Lake NWR Narrative.

Florence Lake NWR

FLORENCE LAKE NATIONAL WILDLIFE REFUGE

Burleigh County, North Dakota

Florence Lake NWR was established in 1935 primarily as a waterfowl refuge. Resident wildlife species especially sharp-tailed grouse, gray partridge, white-tailed deer, and coyotes utilize the refuge.

Florence Lake NWR is a 1,920 acre refuge located in northern Burleigh County approximately 45 miles northwest of Long Lake NWR. The refuge consists of 1,468 acres of fee title, 132 acres of meandered lake, and 320 acres of easement. The fee portion of the refuge consists of 872 acres of native grass, 232 acres of tame grass, 55 acres of DNC, 129 acres of crop, 164 acres of wetland, and 16 acres of woodland. The easement portion consists of 315 acres of cropland and 5 acres of wetland.

The refuge was inspected during a grassland management tour designed to share grassland management recommendations. Personnel from the Regional Office, Arrowwood Complex, and Long Lake staff discussed prescribed burning, Savory system grazing, crowd grazing, and haying. Plans to hay tame grass areas, burn portions of the native prairie, and implement a rotational crowd grazing scheme were formulated and will be implemented in 1988.

Farming on the refuge was done on a share basis. The refuge share in 1987 was four acres of alfalfa bales, 21.5 acres of sunflowers, and 8.1 acres of baled wheat. One 4.5 acre field was broken and one 20 acre field was seeded to alfalfa. Several round feed bales were moved from the farming unit to the old farmstead.

Three rows of a 1984 tree planting were cultivated. The remaining rows were determined to have failed and were summer fallowed.

A crested wheatgrass/alfalfa field that was hayed in 1986 was disced twice in the spring of 1987 by the cooperator. There was a fair to good response by the alfalfa and a good response by the crested wheatgrass.

The refuge contains a fair wetland complex that produces fair numbers of waterfowl. No nest dragging or complete pair counts were conducted this year and there is no good waterfowl production estimate. The refuge is utilized during spring and fall migration primarily by Canada geese, mallards, and diving ducks.

A waterfowl count was conducted October 3 revealed 5,000 Canada geese, 500 ducks (mostly mallards), and 4,000

sandhill cranes. Two hunderd mallards and 50 Canada geese remained on the refuge until December 5 when refuge wetlands froze.

A proposal was written and submitted to the North Dakota Prairie Chicken Committee to consider the Florence Lake NWR area a possible prairie chicken reintroduction site. The Florence Lake NWR area seems to have potential because of the surrounding WPAs and CRP acres. Also, the coyote/badger dominated predator base, and the availability of a winter food supply, will enhance the value as prairie chicken habitat.

Florence Lake NWR does not have any public use facilities and is closed to all hunting. One refuge trapping permit was issued by lottery. The trapper caught one mink, four raccoon, three striped skunk, two coyote, and 61 muskrat.

A washed out dike located just east of the old farmstead was repaired and the west entrance gate was mended.

Law enforcement efforts in the area near Florence Lake resulted in two citatons for attempt to overbag on Canada geese.

A water management plan was submitted for the refuge.

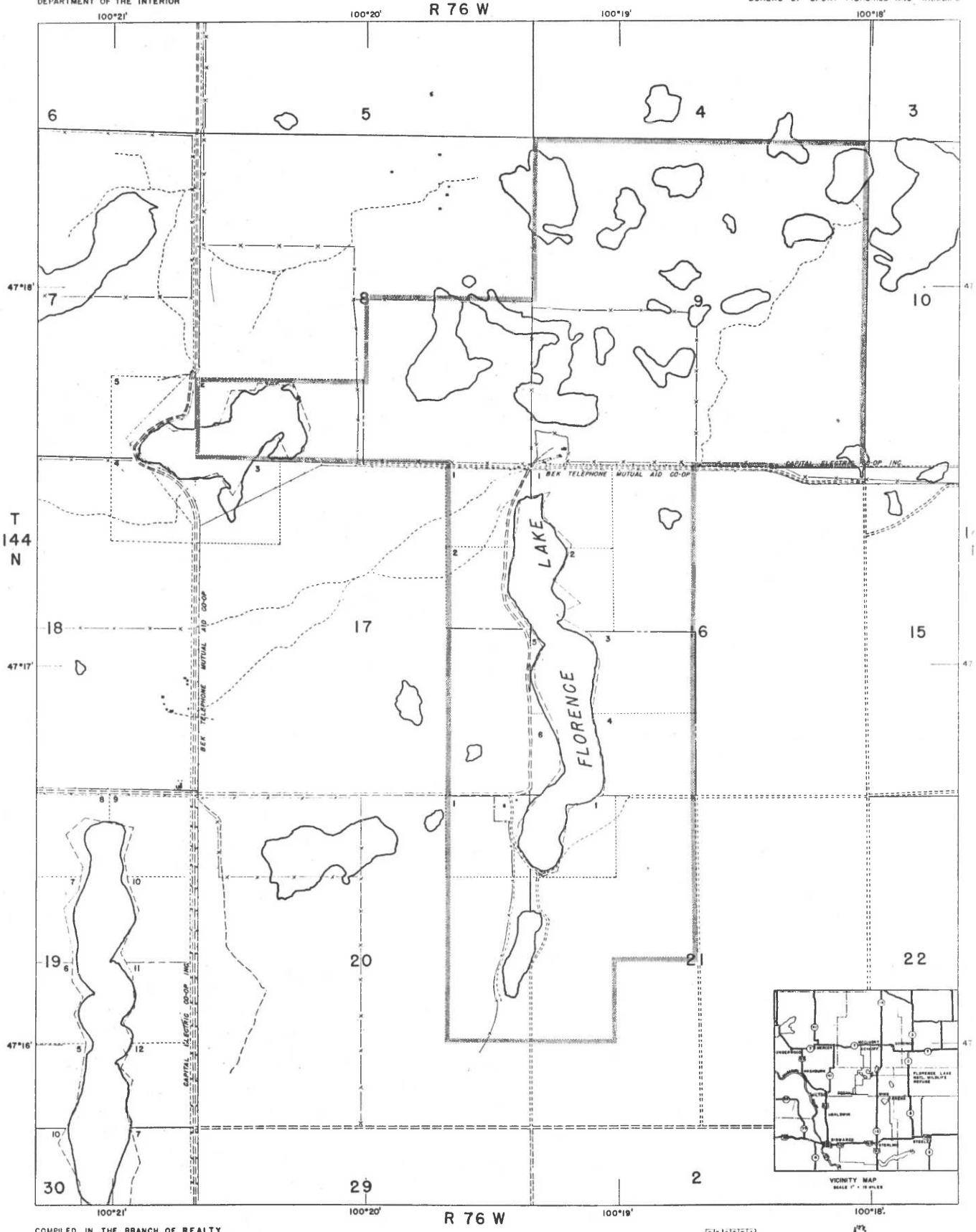
This report was written by Mike Goos and edited by Steve Knode and Dave Stearns (ARD).

FLORENCE LAKE NATIONAL WILDLIFE REFUGE

BURLEIGH COUNTY, NORTH DAKOTA

UNITED STATES
DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE



COMPILED IN THE BRANCH OF REALTY
FROM AERIAL PHOTOGRAPHS AND OFFICIAL
PLATS OF B.L.M.

WASHINGTON, D.C. MAY, 1960

SCALE 0 10 20 40 60 80 CHAINS
0 1/4 1/2 1 MILE

TOWNSHIP DIAGRAM

MEAN DECLINATION 1959

Canfield Lake NWR

CANFIELD LAKE NATIONAL WILDLIFE REFUGE

Burleigh County, North Dakota

Canfield Lake NWR is a 313 acre refuge consisting of three acres in fee title and 310 acres under refuge easement. The refuge is located approximately 35 miles northwest of Long Lake NWR. The refuge easement grants perpetual flooding and restrictions on hunting, trapping and unauthorized entry.

The refuge contains a 215 acre Type V wetland which is partially tree-lined, relatively deep, and used extensively by migrating waterfowl. The refuge is adjacent to the 780 acre Basaraba WPA and the refuge and WPA are managed as one unit.

No waterfowl counts were conducted on the refuge this year. Normally, during fall migration there are several hundred Canada geese and several hundred ducks (mostly divers) using the area.

Enforcement efforts were conducted near the refuge on opening weekend of waterfowl season but no violations were observed.

A water management plan for the refuge was submitted.

Appert Lake NWR

APPERT LAKE NATIONAL WILDLIFE REFUGE

Emmons County, North Dakota

Appert Lake NWR is a 908 acre easement refuge located 15 miles south of Long Lake NWR. Two WPAs, the Kurtz (168 acres) and Schatz (84 acres) were acquired in 1978 within the refuge. The refuge and two WPAs are managed as one unit.

Appert Lake is a 118 acre impoundment of open water and marsh. The dam creating the impoundment is located on a tributary to Long Lake creek and was built by the previous owners. On the edge of the impoundment is a good stand of cottonwood and willow trees.

Repairs were made to the emergency spillway again this year. Gabions were placed in it to decrease the amount of erosion. The dam was inspected by Marshall Fox and Lester Busch, of the Denver Engineering Center.

Gabions being placed in the emergency spillway at Appert Lake NWR. (87-DS)

Five wood duck nesting structures have been placed on the WPAs adjacent to the impoundment. No use of these nests was recorded in 1987.

An April 15 waterfowl count revealed ten mallards, 15 scaup, 5 blue-winged teal, 2 pintails, and 4 gadwalls.

Approximately 40 mallards and green-winged teal used the refuge this fall.

The refuge serves as an important area for upland birds and whitetail deer. There are approximately 50 sharp-tails, 50 ring-necked pheasants, 30 gray partridge, and 50 whitetail deer on the unit.

A water management plan was submitted for the refuge in 1987.

A trapping permit for the refuge was issued and the trapper caught two mink.

Hutchinson NWR

HUTCHINSON NATIONAL WILDLIFE REFUGE

Kidder County, North Dakota

Hutchinson NWR is a 479 acre easement refuge located 40 miles northeast of Long Lake NWR/WMD headquarters. The refuge contains a 267 acre Type V wetland and one 14 acre Type III wetland. The easement is for flooding rights and requires a total restriction on hunting, fishing, and unauthorized entry.

A waterfowl count conducted on October 16 revealed 800 Canada geese and 200 ducks.

A golden eagle was observed on the refuge one November 24.

Refuge staff replaced boundary signs at the refuge.

Boundary signs were replaced at Hutchinson NWR in 1987. (87-DS)

A water management plan was submitted for the refuge in 1987.

Lake George NWR

LAKE GEORGE NATIONAL WILDLIFE REFUGE

Kidder County, North Dakota

Lake George NWR was established in 1935 and includes 3,090 acres protected by flowage and refuge easement and 29 acres reserved from public domain. The refuge contains two Type V lakes, one 1,105 acres and one 286 acres. Good moisture the past two years has resulted in water levels being far above average.

The lakes on the refuge support a few breeding pairs of ducks and at least two pairs of Canada geese. During fall migration several thousand Canada geese, several hundred snow geese, and several hunderd ducks used the refuge.

One trapping permit was issued. A water management plan was submitted for the refuge.

Refuge personnel visited the refuge in October while conducting law enforcement.

Springwater NWR

SPRINGWATER NATIONAL WILDLIFE REFUGE
Emmons County, North Dakota

Springwater NWR is a 640 acre easement refuge 30 miles south of Long Lake NWR. It consists of an earthen/rubble dam and a eight acre impoundments on Clear Creek. Refuge easement rights are for flooding, but no hunting, trapping, or unauthorized entry.

Uplands in the refuge are primarily alfalfa, pasture and woody vegetation along the creek.

Several meetings between refuge personnel and the two adjacent landowners were held this year. As part of an agreement the breach in the dam was closed and repairs were made to the emergency spillway. A beaver-proof cover was installed over the primary spillway and one beaver was removed. At the close of 1987 the impoundment is restored and the landowners appear happy.

The dam was inspected by personnel from the Denver Engineering Center.

A trapping permit was issued for the refuge and the trapper took three beaver.

A water management plan was submitted for the refuge.

The refuge was reposted and signed.

Two golden eagles were seen on the refuge on November 24th.

Jerry Wolsky working on the spillway at Springwater NWR. (87-DS)

Sunburst NWR

SUNBURST NATIONAL WILDLIFE REFUGE

Emmons County, North Dakota

Sunburst NWR is a 328 acre easement refuge adjacent to the 580 acre Schiemeister WPA. Rights granted by the easement include flooding, but no hunting, or unauthorized entry. The refuge contains a 27.5 acre impoundment.

The refuge is utilized by waterfowl as a nesting and migration stop. On October 16 there were 25 ducks (mostly canvasbacks) on the impoundment. In the fall Canada geese moving from the nearby Missouri River utilize the area for daytime resting.

The refuge and the adjacent WPA provide important habitat for upland birds and whitetail deer.

The dam creating the impoundment continues to be controversial in 1987. The emergency spillway is not wide enough to handle above average amounts of run-off. In a year such as 1987 water fills the impoundment, backing water onto the neighboring landowners property including calf barn and calfing area. The flooding generally lasts a few days until the spillway empties the impoundment down to the permament management level. Mr. Lawler (the owner) has contacted FWS personnel several times over the years about the problem and did so again in 1987.

Refuge staff inspected the site in March and discussed the issue with Mr. Lawler. Following the inspection Mr. Lawler was given an opportunity to file a Tort claim against the government, but he elected not to do so. An offer was made to move his calf barn, but the offer was also declined.

To further complicate the issue the dam is in need of repair because of a leakage problem. The Denver Engineering Center estimated that it would cost $750,000 to replace the dam. No work is recommended to be done on widening the spillway or other repairs until a final determination on the fate of the dam has been made.

Clinton Lawlers flooded barn. (87-MWG)

Undersized spillway on Sunburst dam.
(87-MWG)

A proposal was submitted to D.U. to replace the dam and it appears that they may help us in 1989.

A trapping permit was issued for the area in 1987.

The dam was inspected by Marshall Fox and Lester Busch of the Denver Engineering Center.

A water management plan was submitted for the refuge.

The narratives for all the easement refuges were written by Mike Goos and edited by Steve Knode and Dave Stearns.